Final
Environmental Impact Report
Old Arcata Road Rehabilitation & Pedestrian/Bikeway Improvements

City of Arcata

November 16, 2021

Final Environmental Impact Report
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SCH#: 2021010176

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Contents

Table index

Image index

Appendices

1. Introduction

1.1 Purpose of the Final Environmental Impact Report

This Final Environmental Impact Report (FEIR) for the Old Arcata Road Rehabilitation & Pedestrian/Bikeway Improvements Project (Project) consists of the Draft EIR (DEIR), comments received on the DEIR, the City of Arcata's (City; Lead Agency) responses to comments, and revisions to the DEIR. The DEIR identified the likely environmental consequences associated with the Project, and recommended mitigation measures to reduce potentially significant impacts.

To certify the Final EIR, the City Council must find that:

– The Final EIR has been completed in compliance with CEQA;
– The Final EIR was presented to the decision making body of the Lead Agency and that the decision making body reviewed and considered the information contained in the Final EIR prior to approval of a project;
– The Final EIR reflects the Lead Agency's independent judgment and analysis (CEQA Guidelines Section 15090);
– The findings of the EIR are consistent with Section 15091 of the CEQA Guidelines. The Project will not result in a significant unmitigated environment impact, findings are supported by substantial evidence, and the Final EIR includes a Mitigation, Monitoring, and Reporting Program.
– Approval of the EIR is consistent with Section 15092 of the CEQA Guidelines.

1.2 Environmental Review Process

CEQA requires lead agencies to consult with public agencies having jurisdiction over a proposed project, and to provide the general public with an opportunity to comment on the DEIR. This FEIR has been prepared to respond to those oral and written comments received on the DEIR.

The Notice of Preparation (NOP) was made available for a 30-day public review period on May 14, 2021. CEQA Guidelines Section 15082 (b) requires a 30-day response period for input on the scope and content of the EIR. The NOP review period ended on June 21, 2021. A public scoping meeting was held on July 1, 2021. An agency scoping meeting was held on June 21, 2021. The purpose of the two public scoping meetings was to inform agencies and interested parties about the Project, and to solicit input on environmental issues germane to the Project, as well as potential alternatives to the Project. Section 1.4 the DEIR summarizes the public scoping process, and lists areas of controversy based off the public scoping process.

The DEIR was made available for a 45-day public review on August 9, 2021. The review period ended at 5:00 pm on September 27, 2021. The document was made available for review at Arcata City Hall, located at 736 F Street, Arcata, California, 95521 and online at: https://www.cityofarcata.org/720/Old-Arcata-Road-Design-Project. The DEIR was sent to the State Clearinghouse and was published on August 9, 2021 for distribution to State agencies, and was distributed to local, State, and federal responsible and trustee agencies and tribal governments. The general public was advised of the DEIR through a Notice of Availability posted at the County Clerk as required by law, and through a posting in the local newspaper, the Times Standard, on August 8, 2021. A public hearing before the Planning Commission on October 12, 2021 to receive comments on the DEIR was held after the end of circulation period to provide additional opportunity for comment. The Notice of Availability of the Draft EIR was also sent to the listserv of parties

requesting notice on the project (217 recipients) and the City's "Land Use Planning and Environmental Determinations" listserv (94 recipients), as well as direct mailing to adjacent property owners and residents. Postcards were sent to 201 owners and 114 residents, for a total of 315 unique addresses.

One online public hearing to receive comments on the FEIR and to consider approval of the Project will be held during the December 1, 2021 City Council meeting at 6:00 p.m., consistent with Executive Order N-33-20. This FEIR will be provided to the City Council for review and consideration on certification of the EIR as a full disclosure of potential impacts, mitigation measures and alternatives. The Final EIR will be sent to the public agencies who commented on the DEIR at least 10 days prior to certification of the EIR per CEQA Guidelines Section 15088.

If the Project is approved, recommended mitigation measures will be adopted and implemented as specified in the City Council's resolution and an accompanying mitigation monitoring and reporting program (MMRP).

The additions made in this FEIR do not constitute "significant new information" requiring recirculation pursuant to Public Resources Code section 21092.1 and CEQA Guidelines Section 15088.5. The FEIR merely clarifies, amplifies, and makes insignificant modifications to an adequate EIR, per CEQA Guidelines Section 15088.5(b).

1.3 Document Organization of the FEIR

The FEIR is organized into the following chapters:

- **Chapter 1 – Introduction**. This chapter discusses the use and organization of this FEIR and the environmental review process.
- **Chapter 2 – Comments and Responses**. This chapter includes a list of persons, organizations, and public agencies who commented on the DEIR, reproductions of the letters received from the public on the DEIR, and responses of the Lead Agency to those comments.
- **Chapter 3- Comments Received Following the Close of Public Circulation**. This chapter summarized the comments received by the City pertaining to the Project during the Planning Commission meeting on October 12, 2021, to ensure such comments are included in the administrative record for the Project.
- **Chapter 4 – Errata**. This chapter includes text modifications to the DEIR. Proposed text additions are signified with underlined bold text (**example**), and stricken text is signified with strike through (~~example~~).
- **Chapter 5 – References**. This chapter includes references utilized in this FEIR.
- **Chapter 6 – List of Preparers**. This chapter includes the list of individuals who contributed to this document.

2. Comments and Responses

During the public comment circulation period for the DEIR, the City of Arcata received sixty comment letters/emails, which included numerous comments on the DEIR. A list of the comment letters and comments received is shown below in Table 2-1 (either by agency/organization or last name of the individual).

Table 2.1 Public and Agency Comments Received on the DEIR

Letter	Last Name or Agency	First Name	Letter Date	Pgs.	Cmt#
1	Ashton	Diane	September 19, 2021	1	1
2	Mikles	Libby	September 20, 2021	1	1
3	Delany	Marc	August 10, 2021	1	1
4	Delany	Marc	August 19, 2021	2	8
5	Delany	Marc and Kiriki	September 9, 2021	7	7
6	Delany	Marc	September 27, 2021	30	1
7	Delany	Kiriki	August 19, 2021	9	14
8	Delany	Kiriki	August 20, 2021	4	1
9	Ziegler	Denise	August 10, 2021	2	1
10	Ziegler	Denise	August 13, 2021	2	1
11	Power	Jude	August 19, 2021	1	1
12	Stanton	Kathleen	August 19, 2021	2	4
13	Stanton	Kathleen	September 7, 2021	2	6
14	Stanton	Kathleen	September 27, 2021	41	36
15	Armstrong	Sean	August 20, 2021	14	3
16	McPherson	Robert	August 20, 2021	1	3
17	California Dept. of Fish and Wildlife		August 31, 2021	3	1
18	Cashman	Susan	September 7, 2021	1	1
19	Kelsey	Harvey	September 7, 2021	3	2
20	California Highway Patrol		September 8, 2021	4	1
21	California Highway Patrol		September 13, 2021	2	1
22	Lowry	Caroline	September 15, 2021	1	1
23	Bruce	Amy	September 16, 2021	1	1
24	Gale-Zoelick	Rose	September 18, 2021	1	2
25	Stanton	Kathleen	September 1, 2021	1	1
26	Love	Michael	September 19, 2021	1	1
27	Munro-Proulx	Abigail	August 12, 2021	2	7
28	Palmrose	Wayne	September 22, 2021	1	4

Letter	Last Name or Agency	First Name	Letter Date	Pgs.	Cmt#
29	Huges	Rees	September 23, 2021	1	1
30	Ihara	Nancy	September 23, 2021	1	1
31	Inkels	Gordon	September 23, 2021	1	1
32	McNeill	Sam	September 23, 2021	1	1
33	McNeil	Suerie	September 23, 2021	1	1
34	O'Brien	Jess	September 23, 2021	1	2
35	Palmrose	Linda	September 23, 2021	1	4
36	Santi	Jean	September 23, 2021	1	1
37	Sharpe	Chip	September 23, 2021	1	1
38	Sousa	Jim	September 23, 2021	1	1
39	Paliaga	Carla	September 24, 2021	1	1
40	Mietz	Steve	September 25, 2021	2	3
41	Zoelick	James	September 26, 2021	3	3
42	Colbert	Kristi	September 26, 2021	2	2
43	Mayer	Len	September 26, 2021	2	3
44	Minor	Jane	September 26, 2021	1	1
45	Minor	Michael	September 26, 2021	1	3
46	Bayside Cares		September 27, 2021	251	39
47	Caruso	Wendy	September 27, 2021	1	2
48	Mendenhall	Tom	September 19, 2021	1	1
49	Lee	Ali	September 27, 2021	3	3
50	Love	Kari	September 27, 2021	1	1
51	Mietz	Stephanie	September 27, 2021	1	2
52	Paliaga	Carla	September 27, 2021	1	1
53	Smith	Anson	September 27, 2021	1	1
54	Svehla	Cheryl	September 27, 2021	1	1
55	Svehla	Greyson & Claire	September 27, 2021	1	2
56	Klingonsmith	April	September 27, 2021	1	1
57	Ziegler	Denise	September 6, 2021	1	1
58	Brown	Constance	September 8, 2021	1	1

2.1 Master Responses

Review of comments made on the Draft EIR indicated that some comments were made frequently (type of comment), demonstrating a common concern. To allow presentation of a response that addresses all aspects of these related comments, select Master Responses have been prepared. Master Responses are intended to allow a well-integrated response addressing all facets of a particular issue, in lieu of piece-meal responses to each individual comment, which may not have portrayed the full complexity of the issue. The use of a Master Response is in no way intended to minimize the importance of the individual comments. Master Responses are summarized in Table 2.2.

Table 2.2 Summary of Master Responses

Response	Topic
1	Statements of Opinion For or Against Project and Project Planning and Statements Unrelated to Environmental Issues as Defined Under CEQA
2	Substantial Evidence, Speculation, and Unsubstantiated Opinion
3	Parking
4	Noise and Vibration
5	Drainage
6	Community Engagement Process
7	Historical Resources
8	Impacts to Wetlands
9	Standards for Adequacy of an EIR
10	Architectural Area of Potential Effect Maps

Master Response 1 Statements Unrelated to Environmental Issues as Defined Under CEQA

Per CEQA Guidelines Section 15204(a), in reviewing draft EIRs, persons and public agencies should focus on the sufficiency of the document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects of the project might be avoided or mitigated. When responding to comments, lead agencies need only respond to significant environmental issues and do not need to provide all information requested by reviewers, as long as a good faith effort at full disclosure is made in the EIR. Furthermore, CEQA does not require a lead agency to conduct every test or perform all research, study, and experimentation recommended or demanded by commenters.

In several cases, comments include an opinion on the Project, questions about the Project's planning process, and requests that the project be eliminated from consideration. Such comments provide valuable input to the City of Arcata's process of considering approval of a project, and the comment letters will be submitted to the City Council as part of the approval process. Where the comments address the merits of the project and do not necessarily pertain to environmental issues, no further response to comments is provided. Such comments are not comments on the EIR, but comments on the approval of the project, a process that will occur after CEQA documentation is considered for adoption. Nevertheless, if CEQA documentation is adopted for the project, the City of Arcata will consider the recommendations in these comment letters as well as the information presented in the CEQA documentation or elsewhere in the record, and make its decision regarding approval of the project and or consideration of project alternatives.

Master Response 2 Substantial Evidence, Speculation, and Unsubstantiated Opinion

Pursuant to CEQA Guidelines Section 15064, the decision as to whether a project may have one or more significant effects shall be based on substantial evidence in the record of the lead agency. An effect on the environment shall not be considered significant in the absence of substantial evidence. Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts (CEQA Statute Section 21082.2(c), Guidelines Section 15384(b) and 15604 (f)(5)). Argument, speculation, unsubstantiated opinion or narrative, or evidence that is clearly inaccurate or erroneous, or evidence that is not credible, shall not constitute substantial evidence (CEQA Statute Section 21082.2(c), Guidelines Section 15384(a) and 15604 (f)(5)).

Furthermore, CEQA Guidelines Section 15088 (Evaluation of and Response to Comments) states, “The level of detail contained in the response, however, may correspond to the level of detail provided in the comment (i.e., responses to general comments may be general). A general response may be appropriate when a comment does not contain or specifically refer to readily available information, or does not explain the relevance of evidence submitted with the comment.”

Master Response 3 Parking

A number of commenters expressed concern about changes to existing parking on Hyland Street, on Old Arcata Road near Jacoby Creek School, and at the Mistwood Education Center/Bayside Community Hall area. The loss of parking as a result of a project is not considered an environmental impact under CEQA. While parking and transportation projects may have an impact on the environment, the addition or deletion of parking is not an environmental factor analyzed in the CEQA Appendix G checklist and is not cited elsewhere in the Public Resources Code (PRC) or CEQA guidelines. As such, a loss or reorientation of parking for the proposed project is not considered an environmental impact under CEQA. Comments pertaining to parking are not comments on the EIR, but comments on the approval of the project, a process that will occur after CEQA documentation is considered for adoption.

Commenters raised comments about parking in three primary locations: Mistwood Education Center, Hyland Street, and near Jacoby Creek School. Changes to parking for these three areas are described below.

Parking near Mistwood Education Center

A portion of the existing parking near Mistwood Education Center is informally located within the public right of way. A portion of the parking area near Mistwood Education Center parking that is located within the public right of way would be reduced as a result of Project implementation. An open ditch along the north side of Jacoby Creek Road will be replaced with a subsurface storm drainage pipe and will be surfaced with gravel or pavement. The new roadside area will provide additional parking on Jacoby Creek Road near the roundabout.

Hyland Street Parking

The proposed sidewalk on Hyland Street would provide pedestrians connectivity to the crosswalks at Hyland Street and Old Arcata Road. The sidewalk is proposed to be situated so as not reduce the number of travel lanes or on-street parking. Parking on both sides of the road would remain.

Parking Near Jacoby Creek School

A portion of the raised landscaped island in front of the school would be replaced with paved parking stalls. The raised landscape island is narrow in width and currently separates the school parking lot

from diagonal street parking. Maintaining parking near the school was determined to be a priority over retaining the raised landscape island.

The project proposes to formalize on-street parallel parking on the west side of Old Arcata Road for approximately 850 feet north of Jacoby Creek School. The ground surface in designated parking areas would be improved with compacted gravel, a permeable paver system, or similar design.

In addition, there are no formal or dedicated parking areas on the west side of Old Arcata Road to the south of Jacoby Creek school. The Project will include several additional parallel parking spots in that area.

While neighborhood concerns regarding parking are not environmental concerns as analyzed under CEQA, the City Council could consider comments related to reductions or changes to parking during their consideration of approval of the project.

Master Response 4 Noise and Vibration

Potential impacts related to noise and vibration are considered environmental issues under CEQA. Environmental impact analysis related to noise and vibration is addressed in Section 3.10 of the Draft EIR. A number of commenters expressed concern regarding the potential for increased operational noise at the Mistwood School, as a result of shifting the roadway closer to the building. Additionally, a number of commenters expressed concern that construction-generated vibrations may damage historic structures in or near the Project.

As concluded in Section 3.10.6 (Impact NOI-a) of the EIR, operational noise would decrease due to a quieter, smoother roadway surface and traffic calming measures such as speed humps and improved signage. The proposed roundabout at the Jacoby Creek Road intersection would further decrease operational noise by reducing the amount of acceleration and braking associated with stopping, turning, and reaccelerating at the current intersection. The roundabout would remain consistent with the City of Arcata Noise Element. Projected noise contours in the Noise Element show the highest level of anticipated noise along and adjacent to the immediate roadway of Old Arcata Road where the Mistwood School is located. However, as a conclusion of noise-related impact analysis in Section 3.10.6 (Impact NOI-a) of this EIR, noise levels were determined not to exceed the threshold of significance for sensitive receptors, including the Mistwood Education Center. Therefore, noise-related mitigation was not determined to be necessary.

As discussed in Section 3.10 (Noise) on page 3.10-3 under Regulatory Setting/Regional and Local, the impact evaluation related to Noise did consider City of Arcata General Plan policies N-3b (Transportation Noise) and N-3c (Roadway Projects), finding the Project not to conflict with either policy in addition to other applicable City and County noise-related policies.

Vibration analysis results showed that the Project would not create vibrations that could damage buildings. None of the historical resources are constructed of sensitive materials such as unreinforced masonry or adobe. The Caltrans guidance for historic and old buildings is 0.5 peak particle velocity (PPV) in inches/second for transient sources and 0.25 PPV in inches/second for continuous, frequent, and intermittent sources. For older residential structures, the transient source threshold is also 0.5 PPV inches/second, and 0.3 PPV in inches/second for continuous, frequent, and intermittent sources (Caltrans 2020, Table 19). Equipment to be used during construction is included in Section 2.6.2 of the Project Description (page 2-7) and does not include any pile drivers. Construction equipment to be used that could be vibratory includes rollers, plate compactors, and jackhammers. At a distance of 25 feet from the source, the reference PPV in inches/second is 0.210 for a vibratory roller and 0.035 for a jackhammer (Caltrans 2020, Table 18). Plate compactors are not included in the Caltrans 2020 (Table 18) guidance; however,

given they are considerably smaller than a vibratory roller, it is assumed their resulting vibration is also under the established thresholds. Thus, the most vibratory of equipment to be utilized during construction would fall under the threshold to prevent damage to historic and old buildings. Additionally, the roller would have a vibratory function that can be turned off and on as needed and would not be entirely vibratory. The level of operational vibration resulting from a vehicle interacting with a speed bumps varies based on vehicle speed, speed hump design, soil substrate, and the size of the vehicle. However, the maximum vibratory levels for vehicles under 7.5 tons were found to be 0.23 PPV (Watts and Krylov 2000), which is also under the Caltrans guidance thresholds and thus also would not have the potential to damage any historic or old buildings.

Master Response 5 Drainage

Drainage information provided in the DEIR conforms with Section 15146 of the CEQA Guidelines, CEQA Guidelines - Degree of Specificity: t*he degree of specificity required in an EIR will correspond to the degree of specificity involved in the underlying activity which is described in the EIR.*

Potential impacts related to drainage that could result in an impairment to water quality are considered environmental issues under CEQA. Environmental impact analysis related to drainage is addressed in Section 3.9 (Hydrology and Water Quality). The Project includes facilities to control and convey runoff from paved areas. Runoff from the roundabout and roadway areas adjacent to Mistwood and Bayside Hall would be directed to new drainage inlets and underground piping. The drainage would then be conveyed through a network of existing underground piping that extends south along Old Arcata Road and ultimately discharges to an open channel on the west side of Old Arcata Road (see Figure 2-5 of the DEIR, which depicts storm drain enhancements south of the roundabout).

Under existing conditions, roadside drainage near the intersection of Jacoby Creek Road and Old Arcata Road is an ad-hoc system of ditches and driveway culverts. The project would upgrade existing drainage into a formal, sub-surface system to improve roadside drainage. The existing drainage along the north side of Jacoby Creek Road is comprised of an open ditch, driveway culverts and drainage inlets. Jacoby Creek Road's approach to the roundabout would be realigned over a portion of the existing roadside ditch. A portion of the existing ditch is also proposed to be filled to accommodate additional on street parallel parking just east of Bayside Hall. In order to continue to convey the drainage, new inlets and underground piping would be extended.

Based on the 30% design, the Project would increase impervious surface by approximately 15,200 square feet (approximately 0.35 acres), which is less than 0.03% of the total 12.8 acre Project Area as shown in Figure 2-2 through Figure 2-5 of the DEIR and thus negligible. Of the approximately 15,200 square feet, approximately 8,000 square feet are attributable to the roundabout, approximately 7,150 are attributable to the proposed pathways. These numbers will likely adjust as the design process progresses; however, any such adjustments will be insubstantial, based on these considerations. These details have been added to the Errata in Final EIR Section 4; however, the impact analysis remains unaffected. To improve drainage conditions near the roundabout, the Project design would incorporate increased subsurface retention (e.g. larger pipes or parallel pipes) as needed to balance the modest increase in runoff resulting from increased impervious surface. As the design progresses, permeable pavement could be incorporated in key locations (e.g., parking near the sewer pump station) to reduce surface runoff and further improve drainage conditions. Pathways would be located throughout the Project Area and not concentrated in one location. As such, pathways would not substantially increase surface impermeability in any one location.

Improvements to the north side of Jacoby Creek Road will not improve drainage or reduce flooding at the Bayside Hall or Mistwood Education Center parking areas; however, the roadway and roundabout drainage

facilities will better convey and direct roadway drainage away from these areas. Improvements will not exacerbate existing drainage limitations at the Bayside Hall or Mistwood Education Center parking areas. As analyzed in Section 3.9 (Hydrology and Water Quality), Impact HWQ-b and Impact HWQ-c (page 3.9-12), the Project would not substantially alter existing drainage, change the rate of surface runoff, or result in on- or off-site flooding. Changes in impervious surfaces would be small in scale and would not result in a substantive increase in surface runoff.

Between Hyland and Jacoby Creek Road, the roadway would be crowned with the western half draining to the landscape/swale located between the road and walkway. Pipes and inlets will be sized to City or County standards. New inlets in the swale and underground piping would then convey the runoff to existing discharge points. There is an existing storm drain system (inlets and pipes) on the east side of the road, which will continue to collect and convey runoff.

To ensure that the Project would not negatively impact drainage conditions, a drainage analysis will be prepared prior to final design, as required under Mitigation Measure HWQ-1. The drainage analysis would compare the peak runoff from existing and proposed conditions and analyze the conveyance capacity of drainage system. If warranted, the existing and proposed drainage facilities would be modified to ensure no environmental impact, particularly to adjacent properties. The requirement to incorporation recommendations from the drainage study are fully incorporated into the Project, as included in Mitigation Measure HWQ-1 (page 3.9-10). Through the drainage study, the project is obligated to demonstrate existing drainage issues in the area would be not compounded.

Master Response 6 Community Engagement Process

The Project is a direct result of input received from a community outreach and planning process led by the City of Arcata. The need for improvements was substantiated during a City-led community design charrette process, which included the identification of deficiencies and potential improvements. The results of the community design charrette led to the development of a Project Study Report, and the City Council selection of a preferred alternative in November 2017. Community outreach completed for the Project, in addition to the engagement specifically held in relation to the preparation of the EIR, is summarized in Table 2-3.

Table 2.3 Public Outreach Summary

Date	Meeting Type/Topic
September 12, 2016	Community Charrette Event #1 – Kickoff Workshop
September 26, 2016	Community Charrette Event #2 – Walk Audit
October 18, 2016	Community Charrette Event #3 – Pop-Up Demonstration
October 19, 2016	Community Charrette Event #4 – Open House
October 20 - November 4, 2016	Online Community Survey
November 15, 2016	Arcata Transportation Safety Committee Meeting – Project Presentation
December 6, 2017	City Council Meeting – Project Presentation & Selection of Preferred Alternative
August 15, 2019	Community Meeting – Project Update & Preliminary Design
July 1, 2021	DEIR Public Scoping Meeting
August 19, 2021	Presentation of the Project to the Historic Landmark Committee Meeting
October 12, 2021	Presentation of the Project to the Planning Commission

Master Response 7 Historical Resources

Most of the DEIR comments regarding historic resources are regarding three topics: the identified Area of Potential Effects (APE), identification of historical resources, and Project impacts to historical resources. A general response to these three topics is below.

Prior to establishing the APE, JRP Historical Consulting, LLC (JRP) reviewed existing documentation regarding historic resources in and around the Project area and identified known existing historical resources throughout the entire Project area. This included reviewing a 1978 historic resources report by the Humboldt County Department of Public Works (Humboldt County DPW 1978), the City of Arcata's historical landmarks list, the National Register of Historic Places and California Register of Historical Resources, and other sources as noted in the EIR. JRP also considered the potential for a historic district in the Project area. Then to establish the APE, JRP took into consideration the different Project elements and activities and the relationship the built environment along the Project corridor has with the project elements. With this information, JRP considered the potential Project effects on properties throughout the Project corridor and an APE was established that encompasses the six parcels adjacent to the roundabout that could be potentially affected by the Project. The six parcels adjacent to the roundabout are:

1. Old Jacoby Creek School at 2212 Jacoby Creek Road, Assessor Parcel Number (APN) 501-011-006
2. Former Temperance Hall at 1928 Old Arcata Road, APN 501-012-012
3. Former Bayside Grange at 2297 Jacoby Creek Road , APN 501-012-002
4. US Post Office (current) at 1836 Old Arcata Road, APN 501-011-028
5. Residence at 1835 Old Arcata Road, APN 501-031-042
6. Residence at 1895 Old Arcata Road, APN 5001-031-031

The pedestrian survey conducted for the historic resources study verified that no additional parcels should be included in the APE.

The architectural APE was established by the City and Caltrans with input from JRP. The APE includes areas that may be directly and indirectly affected by the Project along the Project corridor and is intended to be used expressly for the purposes of Caltrans review. The APE includes portions of all assessor parcel numbers (APNs, parcels) located along the Project corridor, as the portion of each APN that fronts Old Arcata Road, Bayside Road, or Jacoby Creek Road was included within the boundary. The DEIR analyzed impacts to properties both within and outside of the APE established by Caltrans and the City for Caltrans' purposes. The APE includes the location where project activities will occur, all of which are within the existing right-of-way, and no physical impacts on historical resources will result from the Project. The APE also encompasses parcels that could experience potential visual impacts. Parcels adjacent to the Project corridor where the project does not pose a visual effect to built environment resources were not included in the APE. This determination of where a potential visual effect might occur was made based on the various Project activities at different locations and the existing conditions along the Project corridor. After evaluating these considerations, the six parcels adjacent to the location of the proposed roundabout (listed above) were incorporated into the APE because of the potential for visual impacts. As identified in the Historical Resources Evaluation Report (HRER), only these six parcels surrounding the proposed roundabout would have the potential for visual impacts from the Project, and, as stated above, even the properties within the APE would not be physically impacted by the Project. The addresses of the six parcels have been incorporated in the Final EIR Section 4 errata.

Along the remaining part of the Project corridor, the APE follows, or closely follows the right-of-way property line and does not encompass any historic-era built environment resources. The reason the parcels near the roundabout were included in the APE and others not included was because of the difference in the nature of the project at the intersection of Old Arcata Road and Jacoby Creek Road, that is, construction of the roundabout and reconfiguration of the intersection. Project activities in the remainder of the Project corridor, such as restriping and resurfacing, construction of a new sidewalk, adding a bike lane, etc., are minor, small scale, and not notably dissimilar in use or appearance from existing conditions, thus there was no potential for a visual effect in these areas.

After establishing the APE, JRP prepared an HRER that identified historical resources in the APE. Preparing the HRER entailed extensive research and efforts to identify known and potential historical resources, preparation of a historic context, property-specific historical research, intensive level field survey of the entire Project corridor. This effort found that three of the six properties in the APE included buildings that are less than 45 years old and did not require evaluation or analysis (1836, 1835, and 1895 Old Arcata Road). The three other properties in the APE are the Old Jacoby Creek School at 2212 Jacoby Creek Road, the former Temperance Hall 1928 Old Arcata Road, now Mistwood Education Center, and the former Bayside Grange at 2297 Jacoby Creek Road, and all are historical resources under CEQA. The Old Jacoby Creek School was listed in the National Register of Historic Places in 1985 and thus is automatically listed in the California Register of Historical Resources. JRP evaluated the former Temperance Hall (1928 Old Arcata Road) under National Register and California Register criteria and found it eligible for both. JRP evaluated the former Bayside Grange (2297 Jacoby Creek Road) under National Register criteria and found it eligible. This property was previously listed in the California Register.

In addition to these three historical resources in the APE, there are four other properties with recognized historic status that are outside of the APE, but are along the Project corridor (1365, 1686, 1752, and 1786-1788 Old Arcata Road). These were identified in a 1978 study and determined eligible for the National Register, a conclusion concurred by the State Historic Preservation Officer (SHPO). One of these four properties is also a City Historic Landmark. While not within the APE, these four are within the Bayside Specific Plan District as defined in the City of Arcata 2020 General Plan and were also identified in the EIR.

The 1978 study also documented several other buildings and structures along the Project corridor, but outside of the APE. These properties, while documented in the 1978 study, did not receive SHPO concurrence as eligible for listing in the National Register and none are listed as City of Arcata Historic Landmarks. Nonetheless, their recognition in the 1978 study gives them the potential to be local historically noteworthy properties.

Furthermore, JRP analyzed the Project corridor for a possible historic district in or adjacent to the APE including parcels outside of the APE. This entailed a pedestrian survey of the entire project corridor to make observations of the buildings and structures and of the overall setting. Analysis also included consideration of the dates of construction of the buildings and structures, and the overall history of Bayside. In this analysis of a potential historic district, JRP used National Register and California Register guidelines as to what constitutes a historic district. JRP concluded that there was no potential historic district because there is not a sufficient concentration or a discrete grouping of properties that are united historically, aesthetically, culturally, or architecturally. Any potential concentration of older properties in this area is disrupted by buildings interspersed throughout the Project corridor that have lost historic integrity, that do not share unifying historical, aesthetic, cultural, or architectural characteristics, or that were constructed in recent decades.

Following the identification of historical resources that would be potentially affected by the Project, JRP conducted an analysis of Project impacts on the seven historical resources noted above. Several key points

are important to this analysis: 1) all Project activities are within the existing public right of way, 2) the Project will not encroach onto any private parcels, 3) the Project will not entail removal of any physical feature of any historical resource or potential historical resource considered character defining or necessary for the resource to convey its historical significance, and 4) thus, the only potential impacts to historical resources are related to visual and atmospheric changes.

An impacts analysis is an assessment the effect of a Project on the integrity of a historical resource. There are seven aspects of integrity: materials, workmanship, design, location, feeling, association, and setting. As the Project will only have visual effects, the only aspect of integrity that will be altered by the Project is setting. With respect to the three historical resources in the APE near the proposed roundabout, several changes to the historic setting have already occurred at this location. In 1946, the historic Old Arcata Road/Jacoby Creek Road intersection was reconfigured, and Old Arcata Road realigned into a modern, sweeping curve through Bayside Corners. The Project, therefore, is not proposing to replace the original, historic intersection, but rather a modern intersection reflecting modern highway design and engineering that does not contribute to the significance of the three historical resources. Other aspects of the setting at the intersection have also changed included the loss of many late 19th and early 20th century buildings, and the construction of many newer buildings within the past 30 years. Even with construction of the proposed roundabout, Bayside Corners will still largely maintain its rural feeling and setting. In addition to the roundabout, the other Project components near the roundabout such as sidewalks, streetlights, and crosswalks are modest in scale and do not alter the setting of any of the historical resources to any significant degree. While the Project will result in some alterations to the setting, setting is only one of seven aspects of integrity, and the diminishment of setting will not be substantial and does not require specific mitigation. Therefore, following construction of the project, these properties will retain a high degree of overall integrity and retain their ability to convey their historical significance.

In addition to assessing impacts of the historical resources in the APE, impacts analysis was applied to the four historical resources outside of the APE, but within the Bayside Specific Plan District, with consideration of all other parcels along the Project corridor that are outside of the Project APE. Project activities in these areas would be such things as restriping and resurfacing pavement, construction of a new sidewalk on one side of the road, bike lanes, and paving driveway approaches. As noted earlier, all of these Project activities are entirely within the existing roadway right of way and would not entail the removal or alteration of any landscape feature that is, or could be, considered a contributing feature to the historic character of any property. Proposed Project activities adjacent to these parcels are relatively minor, small scale, and not notably dissimilar in use or appearance from existing conditions. Thus, the Project would not substantially alter the setting or result in a substantial adverse change. These properties along the Project corridor outside the APE would retain their overall integrity and retain their ability to convey their historical significance or potential historical significance.

Master Response 8 Impacts to Wetlands

A number of comments raised concerns about impacts to wetlands that would occur as a result of the Project or related concerns pertaining to wetland mitigation. As described in Section 3.3 – Biological Resources under Impact BIO-c (pages 3.3-26 and 3.3-25), impacts to wetlands would not occur as a result of the Project and compensatory mitigation for wetland impacts is thus not required under CEQA or by jurisdictional resource agencies. As noted on page 3.3-25, a recent 2021 wetland delineated update determined the small area near the intersection of Old Arcata Road and Jacoby Creek Road where a small wetland (0.002 acres of Palustrine Emergency wetland) had been delineated in 2018 no longer met the criteria for a three-parameter wetland. The USACE completed a field review and concurred, issuing an updated jurisdictional determination (USACE 2021).

Wetlands located adjacent to (within the vicinity of) the Project Area, as well as wetlands within the Project Area to be avoided during construction, would be protected under Mitigation Measure HWQ-1 (page 3.9-10 and 3.9.11), which states:

> "*In instances where excavation occurs within the vicinity of stream channels, flowing ditches, or wetted waters of the U.S. or State, erosion and sediment control measures shall be implemented. These measures shall include installation and maintenance of silt-fence along channel banks or wetted waters as specified in Project designs, and development of erosion control plans to prevent inadvertent sediment delivery."*

Delineated one-parameter wetlands are considered Waters of the State. Delineated three-parameter wetlands are considered Waters of both the U.S. and the State. Additionally, per Section 2.6.1 of the Project Description (page 2-6), work near wetlands would occur during the dry season between May and October.

Master Response 9 Standards for Adequacy of an EIR and Disagreement Among Experts

Section 15151 of the CEQA Guidelines discusses the standards for adequacy of an EIR and specifically notes disagreement among experts does not make an EIR inadequate. Section 15151 states:

> *An EIR should be prepared with a sufficient degree of analysis to provide decisionmakers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at disclosure.*

In preparing this EIR, the City has incorporated considerable analyses that include detailed technical evaluation of environmental resources. Where necessary and appropriate, the EIR relied on Project-specific technical evaluations for:

– Wetlands, special status plants, and other biological resources,
– Visual resources, hazards, and
– Historical and archaeological (cultural) resources.

These technical evaluations were prepared by qualified professional consulting scientists, archaeologists, and historians and were approved by Caltrans qualified environmental staff following a robust review process and referenced throughout the EIR. Biological resource evaluations were specifically appended to the EIR itself. Cited technical references are publicly available on the City's Project-dedicated website, https://www.cityofarcata.org/720/Old-Arcata-Road-Design-Project. As a result of these technical evaluations and associated impact analyses, the City has provided substantiative analysis to both disclose potential environmental effects resulting from the whole of the Project to the public and to inform the City Council as to the potential environmental consequences of the Project.

CEQA Guidelines Section 15151 also notes disagreement among experts does not make an EIR inadequate and recommends summarizing the main points of disagreement among experts. While the City's analysis regarding potential resources to historical resources was both extensive and lengthy, comments received regarding potential impacts to historical resources (please see Comment Letters 12, 13, and 14 from Ms. Kathleen Stanton, M.A., Historical Resources Consultant) indicate the commenting expert disagrees with the City's consulting expert, JRP Historical Consulting, LLC. In responding to

comments raised in Comment Letters 12, 13, and 14 pertaining to historical resources, as well as comments submitted by other members of the public also addressing historical resource-related issues, the City has fully disclosed the complete analysis and results assessed for the potential Project-specific impacts to historical resources and has directly responded to specific technical points of disagreement herein.

Master Response 10 Architectural Area of Potential Effect Maps

At the beginning of public circulation on August 9, 2021, all documents cited by reference in the EIR were publicly posted on the City's Project-dedicated website, https://www.cityofarcata.org/720/Old-Arcata-Road-Design-Project. Among the shared documents was the Historical Resources Evaluation Report (HRER), prepared for the Project by the City's consulting expert, JRP Historical Consulting, LLC. The HRER is a lengthy technical document that evaluated potential impacts to historical resources that could occur as a result of the Project. The document is also the technical basis for review and approval of the Project under Section 106 of the National Historic Protection Act (NHPA) by the State Historic Preservation Officer (SHPO). Appended to the HRER was a design-level map set that included two boundaries – an architectural APE and an archaeological APE. The map set was labeled as confidential, as it includes detailed, location specific archaeological information regarding the exact location of sensitive archaeological resources locations within the Project Area. Archaeological site information must be kept confidential pursuant to both federal and state law, as well as the SHPO guidance. In part, archaeological site information is withheld from public disclosure to avoid looting and other types of damage to sensitive archaeological resources.

The City inadvertently published this confidential map set on its Project-dedicated website. Once the City realized the confidential map set had been accidentally released to the public, the confidential information was immediately redacted and affected tribal representatives were contacted. As a result, the architectural APE map set was also redacted, as it was included on the map set as the archaeological APE. Section 3.4.1 (Cultural Resources – Study Area) on page 3.4-1 specifically describes the APE as the Project's area of direct impacts (ADI), which are shown on Figures 2-2 through 2-5, plus six adjacent parcels that could experience a visual impact. The addresses of these six adjacent parcels (specific buildings) evaluated in the DEIR are explicitly noted with street addresses throughout Section 3.4. Thus, the location of these parcels and the buildings of interest is clear absent a separate associated figure or map. However, the confidential archaeological information has been redacted from the map set. Please see the Historical Resources Evaluation Map, added as errata and including the architectural APE boundary, in Appendix B. The draft EIR and the HRER included narrative descriptions of the properties included in the architectural APE (see Master Response 7 regarding historical resources and responses to comments in Comment Letter 14), and the information about historic properties potentially impacted by the Project are described in DEIR Section 3.4 (Cultural Resources).

2.2 Public Comments Received During Circulation

This section includes copies of the comment letters and e-mails received during the 45-day public review period for the DEIR. Responses to each comment are provided after each letter. Some comment letters included embedded external correspondence between parties; the external correspondence was not submitted as comment on the Draft EIR. No response is provided to external correspondence.

Comment Letter 1

From: Diane Home
To: David Loya; Netra Khatri
Subject: Old Arcata Road Rehabilitation Project: recommendations to improve safe passage to and from Anderson Lane for pedestrians, non-motorized and motorized vehicles
Date: Sunday, September 19, 2021 5:08:06 PM

I have lived at 1673 Brigid Lane, which is off Anderson Lane, since August, 1997. Because of the speed at which motorized vehicles come around the curve in the northbound lane of Old Arcata Road just before Anderson Lane, turning onto Old Arcata Road in a motorized vehicle or trying to cross the road on foot is challenging and oftentimes dangerous. If there were at least one, but preferably two, speed hump(s) between Jacoby Creek School and the yellow crosswalk at Anderson Lane, I believe safer passage in and out of Anderson Lane would be facilitated. In addition, an additional speed hump in the southbound lane between the roundabout at Buttermilk and the crosswalk at Anderson Lane would provide the same traffic calming/slowing outcome. The recommended speed humps, by reducing the speed of motorized vehicles, would provide additional safety protections, in the vicinity of the proposed pedestrian sidewalk and bicycle lane improvements along Old Arcata Road. These recommendations include the needs and safety of the multigenerational residents of Brigid and Anderson Lanes, who are citizens of Arcata and deserve to be considered in planning for our amazing and proactive community. Thank you for your consideration of my recommendations.

1-1

Diane E. Ashton

[redacted]

Sent from my iPad

Letter 1 – Response to Comments

Response to Comment 1-1

Request for two speed humps between Jacoby Creek School and Anderson Lane

This commenter is requesting additional safety measures, such as additional speed humps between Jacoby Creek Lane and Anderson Lane but does not question the adequacy of the EIR. The current 30% design includes replacement of the existing speed hump just north of Jacoby Creek School, between the residences at 1500 Old Arcata Road and 1524 Old Arcata Road. Additionally, the existing speed table/raised crosswalk in front of Jacoby Creek School will be replaced. As the final design progresses, consideration will be given toward an additional speed hump between Anderson Lane and the residence at 1500 Old Arcata Road. The recommendation for additional safety features such as speed humps will be considered by engineering staff as the design progresses.

From: Netra Khatri <nkhatri@cityofarcata.org>
Sent: Monday, September 20, 2021 1:19 PM
To: Libby Mikles
Subject: RE: Crosswalk safety

Hi Elizabeth

Thank you for your email and bringing this item to our attention.
This intersection is part of the Old Arcata Road improvements project and as we move forward with the final design for the project we will consider options for crosswalk enhancement that may include raised crosswalk or speed humps or speed feedback signs.

Phone/email if you need additional information.

Regards

Netra Khatri, P.E.
City Engineer
City of Arcata - www.cityofarcata.org
Office: (707) 825-2173
Cell: (707) 267-4287
nkhatri@cityofarcata.org

-----Original Message-----
From: Libby Mikles [redacted]
Sent: Monday, September 20, 2021 1:05 PM
To: Netra Khatri <nkhatri@cityofarcata.org>
Subject: Crosswalk safety

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

The crosswalk at the intersection of Anderson ln and Old Arcata Rd needs an improvement. I've lived on Anderson ln for 20+years and have experienced problems there. There is a curve just before the crosswalk. Cars round the curve quite fast. There is no warning for the vehicles. Now we have several children in our neighborhood. Their safety is most important. Please remedy the unsafe situation. 2-1

Gratefully

Elizabeth Mikles

Sent from my iPad

Letter 2 – Response to Comments

Response to Comment 2-1

Request for improvements at Anderson Lane Intersection

Please see Response to Comment 1-1, Response to Comment 36-1, Response to Comment 43-1, and Response to Comment 43-2, which also pertain to design recommendations at the Anderson Lane intersection. As noted in the email response from the City Engineer, as the City moves forward with the final design for the Project, additional crosswalk enhancement options will be considered and may include a raised crosswalk, speed humps, or speed feedback signs.

From: Marc Delany
To: Delo Freitas
Cc: COM DEV; Catarina Gallardo; Adam Lassiter
Subject: Re: Notice of Availability of Draft Environmental Impact Report (EIR): Old Arcata Road Rehabilitation Project
Date: Tuesday, August 10, 2021 9:41:27 AM

The more I read up on roundabouts, city of arcata GP (City of Arcata 2020), HC's GP (with the Jacoby Creek General Plan) and the 2016 Caltrans traffic study (No changes required through 2031), the more this part of the proposal stinks pork or graft?

http://www.pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=25

https://www.smartcitiesdive.com/ex/sustainablecitiescollective/roundabout-safety-mixed-results-pedestrians-cyclists/122461/

https://www.easylawlookup.com/California-Law/Government-Code/par-58056/_easylookup.blp?data=GOV&sidfw=&site=EASY&print=&p_start=2573&p_end=2578&p_para=58056&p_epara=58149&displayer=YES&site=EASY&stype=P&sterm=+&smode=AND&sexact=ON&spon=

3-1

Cheers

Marc Delany

On Mon, Aug 9, 2021 at 4:41 PM Delo Freitas <dfreitas@cityofarcata.org> wrote:

> Good afternoon,
>
> This email is to provide notice of the comment period for the Environmental Impact Report prepared for the City of Arcata's Old Arcata Road Rehabilitation and Pedestrian/Bikeway Improvement Project This email is being sent directly to individuals who have expressed interest in receiving project updates Notice was also provided through publication in the *Times Standard* (print date Sunday August 8th) Notice will also be provided by direct mailing to adjacent property owners and residents
>
> An Environmental Impact Report is an environmental document prepared per the California Environmental Quality Act (CEQA) that analyzes potential environmental impacts of a proposed project This report builds on the analysis included in the Project's Initial Study, which also provided analysis of project impacts Both documents are available on the City's website at the link below, under the heading titled "Environmental Review"
>
> https://www.cityofarcata.org/720/Old-Arcata-Road-Design-Project
>
> The public comment period of the draft document begins today, August 9th, and will end 5 p m on Monday September 27th Comment on the analysis included in the Environmental Impact Report may be submitted to the City in writing to the Community Development email inbox (comdev@cityofarcata.org) Comments received before the end of the comment period will be formally responded to in writing, and will be made available on the project webpage and will be provided to the City Council with the Final Environmental Impact Report for their review prior to adoption
>
> The proposed Environmental Impact Report, along with any response to comments received on the draft Environmental Impact Report during circulation, will be considered by the City Council when hearing the project The date of this hearing will be identified after closing the public comment period and evaluating comments received You will receive notice of the date of the City Council hearing by email in advance of the meeting
>
> We appreciate the community's interest and involvement in this project Summaries of community input gathered to date can be also found on the City's website at the link listed above
>
> Sincerely,
>
> Delo Freitas | Senior Planner
> City of Arcata Community Development Department
> Planning | Housing | Economic Development
> p. 707.825.2213 e. dfreitas@cityofarcata.org
>
> **Due to COVID 19, the City has implemented measures to limit in-person contact. City Hall is currently closed to walk-in business. We still strive to provide the full range of city services by phone, email, and web-based services. Since this is an evolving situation, please visit the City's COVID-19 website for updates.**
>
> Humboldt Vaccinated
> #KEEPHUMBOLDTHEALTHY
> #VACCINESSAVE LIVES2021

Letter 3 – Response to Comments

Response to Comment 3-1

Opposition to the Project

The comment notes opposition to the Project. Please see Master Response 1 regarding statements for or against the project, and Master Response 2 regarding substantial evidence. No further response is necessary.

Comment Letter 4

From: Marc Delany [redacted]
Sent: Thursday, August 19, 2021 6:22 PM
To: David Loya; Karen Diemer; Renée Chappelle; mark.arsenault@dot.ca.gov; Brett Watson; Sarah Schaefer
Cc: Terry Francke; Wilson, Mike; Senator McGuire; Johnson, May
Subject: Last night HDR Meeting

Thank you for allowing the public to hear the project in full… (not by a long shot) but agenda said 3 minutes each, Director Loya changed that arbitrarily to 2 min. No questions answered.

When Renee Chapelle tried to correct the problem, a large Brown Act infringement. The Director continued.

Per Brown Act requirements I am asking the public meeting be reheld, with proper notice.

Reheld by CALTRANS who is listed as "Lead Agency" by GHD City of Arcata consultants for this process 4-1

There were 7 people that asked to speak. several asked for answers to " How much of proposed roundabout is in County (100)%

The consultants all spoke for 15 plus minutes each and gave incorrect answers to the public and committee members that might significantly effect votes and recommendations to City Council from Historic Design Review Committee.

I hope you impliment the mitigation, I believe there is a time limit to do so, this is my request as one of the speakers. 4-2

Under CPRA o am requesting a full copy of the meeting, including the post meeting close, where the city subject business continued after gaveling the close until approx. 5:50 PM Aug 19. 4-3

Also a violation of the Brown Act.
Attorney Fres are recoverable under the Brown Act .

California Constitution Amendment Sunshine Ordinance was thoroughly trod over by the deliberate concealment of Alt. A, the 2016 preferred Alt after "no project", for the Historic Design Committee Members.

Concealing the likely damage of building that are currently listed as National Landmarks has damaged any person that considers preservation important as I do, and as the citizens that crafted a succsefuly enacted sope of presevation work on 2212 Jacoby Creek RoadI and the potential historic district also value due process and consistency with the local general plans. Failure to consult as agree to in the county GP and Jacoby Creek GP prevents the county property owners from lawful elected representation in this mater to date. 4-4

The noise is exponentially increased each foot the highway is moved closer to the school or other buildings. As Arcata is painfully aware, the marshy soil of the former wetlands transmits destructive vibration also increased by proximity to old plaster walls recently repaired in kind per historic scope of work. 4-5

Recasting the Arterial as a highway and increasing the traffic increases damage. All of these facts should have been allowed to be heard by the committee advising city council members with their specific expertise. The Community Development Director gave the committee member no chance for a fair evaluation of facts known to him at the time. 4-6

Lack of the previously agreed to notice to property owners abutting was again neglected as required by law within 300 feet? 4-7

Please make all necessary changes and reschedule this meet with Caltrans as lead. 4-8

Sincerely

Marc Delany

--
"I do not pretend to understand the moral universe; the arc is a long one, my eye reaches but little ways; I cannot calculate the curve and complete the figure by the experience of sight; I can divine it by conscience. And from what I see I am sure it bends towards justice" - ***Theodore Parker***

Letter 4 – Response to Comments

Response to Comment 4-1

Public hearing

The comment provides a narrative of a public hearing held on the Project. Please see Master Response 1 regarding statements for or against the project, Master Response 2 regarding substantial evidence, and Master Response 6 regarding the community engagement process. No further response is necessary.

Response to Comment 4-2

Support of mitigation

The commenter requests mitigation; however, the specific mitigation measure supported by the commenter is not identified. As required under CEQA, if the EIR is certified and the Project is approved, the mitigation measures shall be implemented as specified in the City's resolution and an accompanying Mitigation Monitoring and Reporting Program. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 4-3

Requests copy of the August 19th meeting

The commenter requests information pertaining to the August 19 Historic Landmarks Committee meeting. Please see Master Response 1 regarding statements unrelated to environmental issues as defined under CEQA.

Response to Comment 4-4

Historical resources

The commenter asserts the property at 2212 Jacoby Creek Road would be damaged by the Project but offers no substantial evidence. The Project will not damage 2212 Jacoby Creek Road (Old Jacoby Creek School). No project activities will occur on this property. There is no potential historic district as discussed in Section 3.4 (Cultural Resources), pages 3.4-18 through 3.4-20. The Project is consistent with policies related to historical resources in both the City and County General Plans. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. Please see Response to Comment 2-1 and Response to Comment 46-38 regarding Project consistency with the City's General Plan. Please see Response to Comment 46-6 and Response to Comment 46-37 regarding consistency with the County's General Plan. Please also see Master Response 7 regarding historical resources. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 4-5

Noise and vibration impacts

The commenter is concerned about noise and vibration impacts but offers no substantial evidence. Please see Master Response 4 regarding noise and vibration impacts, and Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 4-6

Public hearing

The comment provides a narrative of a public hearing held on the Project. Please see Master Response 1 regarding statements for or against the project, Master Response 2 regarding substantial evidence, and Master Response 6 regarding the community engagement process. No further response is necessary.

Response to Comment 4-7

Non-compliance with noticing agreements and requirements

The commenter is asking if noticing to adjoining property owners has been completed. Please see Master Response 1 regarding statements unrelated to environmental issues as defined under CEQA.

Per Arcata Land Use Code Section 9.78.130 (Draft Environmental Impact Report) subsection C(2), public notice of the review period shall be given in compliance with Public Resources Code (PRC) Section 21092. The public notice shall be published in a newspaper of general circulation, and posted in the County Clerk's office for 30 days. PRC Section 21092 states that the notice shall be given to the last known name and address of all organizations and individuals who have previously requested notice, and shall also be given by at least one of the following procedures:

(A) Publication, no fewer times than required by Section 6061 of the Government Code, by the public agency in a newspaper of general circulation in the area affected by the proposed project. If more than one area will be affected, the notice shall be published in the newspaper of largest circulation from among the newspapers of general circulation in those areas.

(B) Posting of notice by the lead agency on- and off-site in the area where the project is to be located.

(C) Direct mailing to the owners and occupants of contiguous property shown on the latest equalized assessment roll.

Noticing of the Draft EIR is summarized in Section 1.2 of this Final EIR and is compliant with Arcata Land use Code Section 9.78.130 and PRC Section 21092.

Furthermore, per Arcata Land Use Code Section 9.74.020 (B), a notice of hearing to certify a Final EIR is required to be published in a newspaper of general circulation at least 10 days before the hearing, and sent to nearby property owners, the California Coastal Commission, and any persons requesting notice.

Per Arcata Land Use Code Section 9.74.020 (B) and the City's Land Use Development Guide, notices of public hearing shall be mailed or delivered at least 10 days before the hearing to the following affected properties:

– Site Owners. The owners of the property being considered in the application, or the owner's agent, and the applicant.
– Nearby Property Owners. All owners of real property as shown on the latest County equalized assessment roll, within a radius of 500 feet of the exterior boundaries of the parcel that is the subject of the hearing; and any other person whose property might, in the judgment of the Zoning Administrator, be affected by the proposed project.
– Nearby Residents. Residents of each dwelling unit within 100 feet of the exterior boundaries of the parcel that is the subject of the hearing.

Clarification has been provided to address the commenter's question. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 4-8

Request for changes and to identify Caltrans as the Lead Agency under CEQA

This comment pertains to the CEQA lead agency for the Project. Please see Master Response 2 regarding substantial evidence and speculation. Please also see page 109 of Appendix E of the DEIR (Final IS/MND, Response to Comments, and Errata) regarding Determination of the Lead Agency.

Concerning the issue of Lead Agency under CEQA, CEQA Statute and Guidelines recognize that multiple public agencies may have approval authorities over a single project, and provides guidance on determination of which agency is most appropriate to identify as the Lead Agency under CEQA. CEQA further defines which agencies may be considered 'Responsible Agencies' or 'Trustee Agencies', depending on regulatory jurisdictions, approval authorities, and other factors.

The City of Arcata was determined to the be the most appropriate Lead Agency under CEQA because the vast majority of the project area is located in City limits, the City is the project sponsor, and the City is the recipient and agency responsible for administration of project funding via Caltrans Local Assistance funds. As stated in CEQA Guidelines Section 15051, when two or more public agencies will be involved in a project, if the project will be carried out by a public agency, that agency shall be the lead agency even if the project would be located within the jurisdiction of another public agency. Therefore, the City is appropriately identified in the EIR as the Leady Agency for CEQA compliance.

CEQA Statute Section 21165 provides resolution for 'disputes' of which public agency is the Lead Agency. A 'dispute' means a contested, active difference of opinion between two or more public agencies as to which of those agencies shall serve as the Lead Agency. Per CEQA, the Office of Planning and Research shall not designate a lead agency in the absence of such a dispute. There is no dispute between the City and Caltrans regarding which agency is the Lead Agency and, therefore, no resolution or change in Lead Agency is warranted.

Regarding NEPA compliance, NEPA requires federal agencies to assess potential environmental effects of their proposed projects prior to making decisions. Involvement of federal funding creates the 'nexus' to federal action that triggers NEPA. Caltrans has received NEPA Assignment, which allows the agency to act in place of the Federal Highway Administration (FHWA) in reviewing and approving projects under NEPA.

Where the local agency has the principal responsibility for approving and carrying out the project, it is common and appropriate to identify that agency as the Lead Agency under CEQA, and Caltrans as the NEPA authority. Furthermore, the presence of additional discretionary actions (such as permits) with other public agencies does not invalidate the City's responsibility as the CEQA Lead Agency. For the purposes of CEQA, the term 'Responsible Agency' includes all public agencies other than the Lead Agency which have discretionary approval power over the project.

Consultation required under Section 106 of the National Historic Preservation Act (NHPA) is underway and led by Caltrans, as appropriate to Caltrans' federal NEPA assignment, and is specific to historic property impacts. Caltrans' leading Section 106 consultation does not usurp or invalidate the City's role as Lead Agency under CEQA. No further analysis is necessary and no revisions to the EIR are required to be made.

Comment Letter 5

From: Marc Delany [redacted]
Sent: Thursday, September 9, 2021 11:42 AM
To: Kathleen Stanton [redacted]
Cc: Kiriki Delany <kiriki@streamguys.com>; Bob Mcpherson [redacted]
Susan Mcpherson [redacted] Ford, John [redacted]
Bronkall, Bob [redacted] Wilson, Mike [redacted]
Madrone, Steve [redacted] Senator McGuire
[redacted] Arsenault, Mark@DOT [redacted]
Woodward, Lucinda [redacted] Lindquist, Natalie@Parks
[redacted] Grand Jury [redacted]
Subject: Re: Deadline to submit comments on DEIR is 9/27/21

I am analyzing requirements for "Lead Agency" from CEQA guide/NEPA Guide.. Nolo press... most recent edition. There "can be only 1 Lead Agency". Location, project, funding and agency determine if agency is Lead or Contributing... GHD lists Caltrans as Lead for Sec 106. A neighborhood of an affected Landmark requires EIR and SOI standards... 5-1

Separate and majority funding for Roundabout is through CALTRANS, That project is on HC land 100%, it is a vehicular project and never was part of a pedestrian bike project by Arcata. CALTRANS is for Vehicles performance enhancements.... Bike and pedestrian safety is not even arguably a safety improvement for people. 5-2

The projects is a wolf in sheep's clothing and you cannot use 1 project to gain approval in a 2nd project.. "segmenting CEQA" rule. The consultant for Arcata states they are not using SOI standards as required by CALTRANS.

THe APE is very different.

Public comment and approval separated the projects

One project is in HC administration and review by all of the county

The county emergency vehicles will need to approve

The county maintenance and tax burden is a HC countywide decision

The ADA liability is on the county

The required 106 consultation Arcata declines to do is on county

JC General plan is involved in all intra jurisdiction actions and programs as defined in JC General Plan and HC General Plan and Arcata GP. The JC water district has not been consulted.

Sheriff and Fire on JC are county

JC maintenance is county

400 residents of the COUNTY are represented by the BOS and live down JC Road and are not being consulted, nor the rest of the county. No one affected is represented by Arcata

The BOS has fiduciary, tax, and all responsibilities under HC Planning

5-3

This Is just a project near another jurisdiction's project... CALTRANS and HC County are responsible for county roads.

So they need to stop saying there are 2 lead agencies for one project. I'll be happy if they fail to heed this required notification of a mis step in CEQA, NEPA, Caltrans and county planning and GP consistency, and of course Sec 106 requirements to protect national landmarks , state landmarks and historic resources of the county, archeological and historic.

5-3 Cont.

I am asking that the county mark the proposed roundabout, and that county planning review the ALT 1 proposal that was favored by all but Arcata Community Development Director David Loya. City of Arcata has demonstrated a persistent pattern ignoring procedure lately for several CEQA projects, the Foster Ave annexations, Cell Phone Tower projects within 1000' on west side... It goes on and on.... in the most outrageous manner.

5-4

We have asked the county to intervene, and are asking the state to defund the roundabout option, and require the 106 consultation, using Secretary of Interior's standards, viewshed requirements, noise, light, vibration damage known to be harmful along with moving a scenic highway to within 21 feet of a school.

5-5

There is a beter, less expensive, safer, less impactful, publicly approved Alternative that the Arcata Dev Director has mismanaged from 2016 until today. The roundabout was abandoned in 2016 and yet Jan. 2021 dusted off and sent back through as MND....

5-6

Is LAFCO not responsible for 100% of projects between jurisdictions? County Planning is. This intersection was subject to a traffic study in 2016 when the Bayside offramp was studied. Caltrans concluded "No improvements required through 2031 at OAR and JCR". That was the last traffic study. The project contains improvements far south in OAR and areas left of the APE....

Significant impacts, waste of money, less that positive affect on safety, and the county residents oppose this portion, not the work in Arcata. This is a county, CALTRANS project.

5-7

Marc

On Thu, Sep 9, 2021 at 8:37 AM Kathleen Stanton [redacted] wrote:

> Marc,
> It sounds like you're "segmenting" the project :)
> I agree that most controversial part of the project is in the County, but they have agreed to play second fiddle and stay out of the review process and just hand over a permit when the time comes.
>
> The project is going before the City of Arcata's Transportation Safety Committee, the the City's Planning Commission & then the City Council for approval.
> The City of Arcata along with Cal Trans are the Lead Agencies. The County is not.
>
> If you disagree with the way the project's been structured for review, then you'll have to

reach out to the County Planning Director and the Board of Supervisors to complain, but I think it's a little late at this point to bring it up and try and restructure the planning process. Frankly it's all I can do to comment on the HRER and the DEIR before the deadline.
Kathleen

On Sep 8, 2021, at 7:00 PM, Marc Delany [redacted] wrote:

But its going to the Planning Commission 1st???
County Planning Commission?
These are two very different projects, different purposes, different funding, and the significant portion of the work is in the county (Caltrans is the lead agency there for the 106 historic portion there) entirely on county land , affecting county residents and under the Jacoby Creek General Plan, a portion of the county's general plan)

Arcata is the lead agency for the not controversial pedestrian, bike path improvements and Old Arcata Road realignment and repaving.

The projects cannot be combined just to pass over public process required by Caltrans, CEQA, and NEPA

Arcata puts the county at legal risk and denies county residents the benefit of elected representation public participation of the county residents, county wide along with county ADA review requirements under court scrutiny.

Does the county planning director know?

Marc

On Wednesday, September 8, 2021, Kathleen Stanton [redacted] wrote:

Good question, Marc.
Kiriki, Susan & Bob,
When does Chris & Jason want our comments on the DEIR by?

The due date to get them into the City is Mon. 9/27/21.
I would think that the attorneys want our draft comments in a week before that on Mon. 9/20/21 which is 12 days from now.
When's the deadline, Kiriki, Susan & Bob???
Thanks,
K

On Sep 8, 2021, at 4:51 PM, Marc Delany [redacted] wrote:

There are standard ways to determine the APE for Historic

purposes defined in the SOI (Secretary of Interior) guidelines and a visual assessment tool for CEQA and NEPA as previously sent to all. Susie Van Kirk is a recognized expert historian for Bayside and publish a Walking Tour book publish maybe even twice with Jacoby Creek School
I seem to recall 28 properties identified all the way past the church… which is where the projects utilities end… these are in the project. Humboldt county recognizes Old Arcata Road as an historic resource of the county. The historic report generated by Bob Brown and Alex Stilman, Renee Chapell contradict this projects report as does the first 2016 consultants historic report. In one map of APE Mistwood Is excluded! SHPO is one of the agencies not notified when required. The state clearinghouse should have a report on file, and National Park Service the agency that protects Landmark Buildings that are registered. This info will be in our response and Comments that they have to respond to. Kathleen's Ex Archeologist mention the visual historic resource of the Schoolhouse and OAR specifically in 2007 sewer debacle . I forwarded on several time the City of Arcata resolution referring to related items.

This will be in the hard copy brief

What date is that needed by?
There is a planning meeting
There is opportunity to send Arcata a Cure and Correct notice for violating City of Arcata protocol Ordinance for Public Comment and the Brown Act, prop 59, etc too

On Wednesday, September 8, 2021, Kathleen Stanton [redacted] wrote:

> The APE has been segmented so that the consultants didn't have to survey and analyze every property along Old Arcata Rd. for significance and for District eligibility.
>
> We still don't have an APE boundary along the southern stretch of Old Arcata Road south of the Intersection and WE NEED THAT to prove their unlawful behavior. We need this evidence BEFORE the deadline for the submission of DEIR comments so Jason can nail them on it indisputably.
>
> I have tried twice with Netra to get the APE map and he ignores me or tells me that the map we've looked at for the Southern Boundary is NOT the APE, but just the Right of Way Map that the County has for that area.
>
> What I also discovered is that the APE was established by Cal Trans & Netra early on and they're the ones who segmented it and established a phony survey area that goes against the City

of Arcata's General Plan for the Bayside Specific Plan Area which was supposed to be SURVEYED & EVALUATED FOR HISTORIC DISTIRCT/NEIGHBORHOOD CONSERVATION AREA potential.

More to come…
K

On Sep 8, 2021, at 8:25 AM, [redacted] wrote:

Thanks for the work Kathleen!

This APE is very different from the APE on the report to the historic commission as well.

Its not clear to me why the APE boundary changes, or who is defining it.

I thought it was the JRP report that was presented to the historic committee that defined the APE for historical resources.

This seems like they recognized the potential APE was larger, maybe they tried to bury a mistake.

We can add this into the compiled info for review. That report could use some editing down for conciseness.

Cheers,

Kiriki Delany
President
[redacted]

From: Kathleen Stanton [redacted]
Sent: Tuesday, September 7, 2021 10:04 PM
To: Bob Mcpherson [redacted] Susan Mcpherson [redacted] Kiriki Delany [redacted]
Cc: Marc Delany [redacted]
Subject: APE Project Boundaries for the Historic Resource Report

There's something really screwy going on here with the project boundaries aka APE, Area Of Potential Effect.
I hope I make sense here and I hope you'll forward this on to Chris to see if she can unravel the muddied waters
where I think the City and Cal Trans really screwed up.
Thank you,
Kathleen

AREA OF POTENTIAL EFFECT (APE)
(HRER Report pg. 3)

The Area of Potential Effect was limited to the City and County right of way and 6 parcels at the intersection of Old Arcata Road and Jacoby Creek Road where the City of Arcata and Cal Trans thought the Roundabout might have a visual impact on historic resources. The City of Arcata and Cal Trans developed the APE based on their limited knowledge of the history of the area, assuming that there were parcels "where the project does not pose a potential impact to any built environment element, or the character of the property." These parcels "were not included in the APE." (HRER pg. 3) Only 6 at Bayside Corners.

The City Engineer is not qualified to make this determination, nor is Susan Theiss who is also an Engineer (with Cal Trans) and Darrell Cardiff, the PQS Planner with Cal Trans District 1 who is not recognized by the Secretary of the Interior's

Standards as a person qualified to make this judgment call on where historic resources are and aren't located in the project area.

The APE map in Appendix A, Figure 3 of the HRER has now been redacted according to the Arcata Community Development Director, David Loya. "The HRER contains confidential archeological information that was redacted from the report." It looks like this isn't clearly stated in the document that they were redacted. I will have that corrected. It also appears that you have copies of the figures you are asking us for. Can I assist with anything else on this matter?" (email dated 9/7/21)

Figure 3. APE Map
shows the "Overall Boundary" and is labeled as such in the lower right hand side as FIGURE 1.
Beneath the title "Figure 3. APE Map" it refers the reader to "See Sheet 10 for resources in the ARCHITECTURAL APE labeled with Map Reference (MR) Numbers.
(What does MR stand for?)
In the bottom left hand corner it is written "CONFIDENTIAL." It is also signed by Darrel Cardiff, Susan Theiss & Netra Khatri on 9/17/2020.

--
"I do not pretend to understand the moral universe; the arc is a long one, my eye reaches but little ways; I cannot calculate the curve and complete the figure by the experience of sight; I can divine it by conscience. And from what I see I am sure it bends towards justice" - ***Theodore Parker***

--
"I do not pretend to understand the moral universe; the arc is a long one, my eye reaches but little ways; I cannot calculate the curve and complete the figure by the experience of sight; I can divine it by conscience. And from what I see I am sure it bends towards justice" - ***Theodore Parker***

Letter 5 – Response to Comments

Response to Comment 5-1

CEQA lead agency

This comment pertains to the CEQA lead agency for the Project. Please see Response to Comment 4-8 regarding the lead agency under CEQA.

Response to Comment 5-2

Project funding

This comment asserts the roundabout is located entirely within the jurisdiction of Humboldt County, which is not the case (see Figure 2-5). The comment further asserts the roundabout improvements are singularly vehicular improvements. This comment fails to consider the crosswalk and walkway features integrated into the roundabout to support multi-modal transportation. Lastly, the comment asserts, *"bike and safety improvement is not even arguably a safety improvement for people."* Pedestrian facilities, by their very nature, are safety improvements for people. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 5-3

CEQA segmentation

This comment argues segmentation under CEQA, noting various nexuses with the County of Humboldt, none of which have any bearing on environmental issues as evaluated in the CEQA Appendix G Environmental Checklist. Within the context of CEQA, segmentation, or piecemealing, means dividing a project into pieces and evaluating each piece separately in multiple environmental documents. A single EIR has been prepared to evaluate all aspects of the Project under CEQA. There are no additional elements of the Project which have been withheld for independent and/or separate environmental review. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 5-4

Preference for Alternative 1

The commenter asserts Alternative 1 (No Project Alternative) is favored by all. Through the community engagement process, the City Council made the decision to support the roundabout based on public input received. During the community engagement process, public input in favor of the roundabout outweighed support in opposition. Please see Master Response 6 regarding the community engagement process. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 5-5

Request for County intervention and withdrawal of state funds

The comment notes the County has been asked to intervene, and the State has been asked to defund the Project. Please see Master Response 1 regarding statements unrelated to CEQA. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 5-6

Recommendation for project alternative

The comment notes preference for an alternative to the Project but does not specify which alternative is preferred (e.g., Alternative 1 – No Project Alternative vs Alternative 2 – Modified T-Intersection). Alternatives to the Project are discussed in Section 4 of the DEIR. As included in Section 4.5 of the Alternatives Analysis (page 4-15), the environmental impacts of the Project and Alternative 2 (Modified T-Intersection) were found to be equivalent.

Response to Comment 5-7

Jurisdiction of LAFCo

The commenter is asking if LAFCo is responsible for projects that span jurisdictions. Please see Master Response 1 regarding statements unrelated to CEQA. The Humboldt Local Agency Formation Commission (LAFCo) is an independent local agency, with a mission to facilitate changes in local governmental structure and boundaries that fosters orderly growth and development, promote the efficient delivery of services, and encourage the preservation of open space and agricultural lands. The City sent a referral to LAFCo for the Project. LAFCo declined to comment, citing no jurisdiction over the Project. No further analysis is necessary and no revisions to the EIR are required to be made.

Comment Letter 6

From:	Marc Delany
To:	Chris Hamer; Delo Freitas; David Loya; Karen Diemer
Subject:	DEIR Comment
Date:	Monday, September 27, 2021 4:59:43 PM
Attachments:	September 27th 2021.docx

"I do not pretend to understand the moral universe; the arc is a long one, my eye reaches but little ways; I cannot calculate the curve and complete the figure by the experience of sight; I can divine it by conscience. And from what I see I am sure it bends towards justice" - ***Theodore Parker***

September 27th 2021

City of Arcata
Humboldt County

Attn: Director John Ford – H.C
Attn: Delo Freitas, Sr. Planner – City of Arcata Community Development Department

VIA Email

Comment concerning Draft EIR and project(s) collectively termed "Old Arcata Road Pedestrian/Bikeway Improvement Project"

Dear Director John Ford, Mr. Freitas and planning staffs of Humboldt County and the City of Arcata

I call your attention to a project wherein Caltrans is titled Lead Agency and the City of Arcata is also termed Lead Agency. There can only be one Lead Agency in a single project.

Given the above named project occurs in both Humboldt County Jurisdiction outside the city of Arcata's border and within the City of Arcata's border with Federal state, county and City of Arcata funds the project (s) is subject to CEQA and NEPA review, and requires LAFCO approval first. 6-1

In the project record, the City of Arcata states it's intension of obtaining an "easement" from Humboldt County the construct new infrastructure in Humboldt County outside the City of Arcata's border. This would violate several procedures required to carry this out. The project(s) are required by the California Constitution the be consistent with the General Plans applicable, both Humboldt County's General Plan, for portions of new work outside the City of Arcata's border, and Arcata 2020 General Plan, including all procedure therein.

The project(s) is so flawed that I will confine this letter to just the relevant general plan requirements and procedure that are required.

Humboldt County General Plan contains several sub plans for specific areas of the county including Jacoby Creek, also known as Bayside CA a "Hamlet" not in the City of Arcata. Property taxes for this area proposed by the City of Arcata to be developed for the benefit of the City of Arcata are paid to the county at this time,

until such time as the area is annexed into the City of Arcata, should that ever occur. It seems likely those they vast majority of property owners have consistently opposed this change in government numerous times. The proposed project is an attempt to circumvent the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000.

This (Act) establishes procedures for local government changes of organization, including city incorporations, annexations to a city or special district, and city and special district consolidations, in accord with as specified in Government Code Section 56668. LAFCO is 100% responsible for providing planned, orderly, efficient patterns of urban development, and the policies and priorities in Government Code Section 56377

The proposed project would not only burden taxpayers, property owners, businesses, institutions and residents outside the City of Arcata, it would increase or compromise emergency services and other services, and road maintenance that Humboldt County taxpayers pay for.

The project proposes changes, repairs, or new extension, of laterals and main of the existing sewer and water outside the City of Arcata's border. LAFCO is required to review:

FACTORS LAFCO MUST CONSIDER IN REVIEWING PROPOSALS

As specified in Government Code Section 56668, factors to be considered in the review of a proposal shall include but not be limited to:

1. Population, population density; land area and land use; per capita assessed valuation; topography, natural boundaries, and drainage basins; proximity to other populated areas; the likelihood of significant growth in the area, and in adjacent incorporated and unincorporated areas, during the next 10 years.

2. The need for organized community services; the present cost and adequacy of governmental services and controls in the area; probable future needs for such services and controls; probable effect of the proposed incorporation, formation, annexation, or exclusion and of alternative courses of action on the cost and adequacy of services and

3. The effect of the proposed action and of alternative actions, on adjacent areas, on mutual social and economic interests and on the local governmental structure of the County controls in the area and adjacent areas.
4. The conformity of both the proposal and its anticipated effects with both the adopted Commission policies (**STANDARDS FOR EVALUATING PROPOSALS**) on providing planned, orderly, efficient patterns of urban

6-1 Cont.

development, and the policies and priorities in Government Code Section 56377 concerning open-space lands.

5. The effect of the proposal on maintaining the physical and economic integrity of agricultural lands.
6. The definiteness and certainty of the boundaries of the territory, the nonconformance of proposed boundaries with lines of assessment or ownership, the creation of islands or corridors of unincorporated territory, and other similar matters affecting the proposed boundaries.
7. A regional transportation plan adopted pursuant to Government Code Section 65080, and consistent with city or county general plans.
8. The sphere of influence of any local agency which may be applicable to the proposal being reviewed.
9. The comments of any affected local agency or other public agency.
10. The ability of the newly formed or receiving entity to provide the services which are the subject of the application to the area, including the sufficiency of revenues for those services following the proposed boundary change.
11. Timely availability of water supplies adequate for projected needs and specified in Government Code Section 65352.5.
12. The extent to which the proposal will assist the receiving entity in achieving its fair share of the regional housing needs as determined by the appropriate council of governments (beginning at Government Code Section 65580).
13. Any information or comments from the landowner or owners, voters, or residents of the affected territory.
14. Any information relating to existing land use designations.

6-1
Cont.

15. The extent to which the proposal will promote environmental justice. As used in this subdivision, “environmental justice” means the fair treatment of all people of all races, cultures, and incomes with respect to the location of public facilities and the provision of public services.

Humboldt County General Plan October 2017:

California state law requires that each city and county adopt a general plan “for the physical development of the county or city and any land outside its boundaries which bears relation to its planning” (California Government Code, Section 65300). The plan can be understood as an expression of a community's values and its vision for the future, a "blueprint" for anticipated growth and development, both public and private, which forms the basis for most local government land-use decision making. In a larger sense a county general plan is a “constitution for future development,” which is how the California Supreme Court has described it.

6-1 Cont.

The general plan establishes the kinds, locations, and intensities of land uses as well as applicable resource protection and development policies. Land use maps are used to show land use plan designations, constraints, and public facilities.

According to California law, a general plan must contain at least seven elements: land use, open space, conservation, housing, circulation, noise, and safety. It may also contain other elements that a county wishes to adopt. The law also requires periodic review and revision as necessary

- The Humboldt County Public Works Department is responsible for storm drainage within the unincorporated areas of the County
- The Humboldt County Sheriff’s Office is responsible for law enforcement in the unincorporated area
- **IS-G3. Interagency Coordination.** Coordinated planning, prioritization, funding, and implementation of infrastructure and public service projects across jurisdictional boundaries.
- **IS-P1. Coordination with Service Providers.** The County shall work cooperatively with cities and service providers to identify needs and service limitations, secure funding, and implement infrastructure and public service projects consistent with this Plan and capital improvement plans.
- **IS-P3. Requirements for Discretionary Development.** The adequacy of public infrastructure and services for discretionary development greater than a single family residence and/or Accessory Dwelling Unit shall be assessed relative to service standards adopted by the Board of Supervisors, local service providers, and state and federal agencies. Such discretionary development may be approved if it can be found that:
    - Existing services are adequate; or
    - Adequacy will be attained concurrent with project implementation through project conditions; or

    - Adequacy will be obtained over a finite time period through the implementation of a defined capital improvement or service development plan; or
    - Evidence in the record supports a finding that approval will not adversely impact health, welfare, and safety or plans to provide infrastructure or services to the community.
- **IS-P4. Fiscal Impact Assessment.** The fiscal impacts of discretionary development (i.e. projects that require the preparation of an Environmental Impact Report that may have significant impacts on existing and planned public infrastructure and services) shall be considered during the project review process. Significant adverse effects shall be mitigated to the extent feasible.
- **IS-P5. Mitigation of Cross-jurisdictional Impacts.** The County shall work with the cities to ensure impacts associated with new development are mitigated for each affected jurisdiction.
- **IS-P7. Capacity of Facilities and Land Use Decisions.** The County shall evaluate the capacity and sizing of road and drainage facilities in coordination with water and wastewater service providers to determine adequacy for proposed land uses and discretionary development.
- **IS-P9. District Boundaries, Spheres of Influence, and Community Plans.** District boundaries, spheres of influence, municipal service reviews, and community plans shall be mutually compatible and support the orderly development and timing of infrastructure and services.
- **IS-P12. Road and Drainage System Funding Sources**. Develop funding mechanisms and sources to support the construction and maintenance of road and drainage facilities consistent with the policies and standards of the Circulation and Water Resources elements.
- **IS-P13. Drainage and Flood Control.** Develop and maintain a countywide drainage and flood control plan to guide capital improvements and maintenance and serve as a basis for long-term sustainable funding mechanisms.
- **IS-P21. County Facilities.** Proposed County capital projects and facilities shall be analyzed for consistency with this Plan and applicable city general plans.
- **IS-P25. Fire Service Impacts from New Development**. During review of discretionary permits within fire related district boundaries or identified response areas, utilize recommendations from the appropriate local fire chief as feasible mitigation measures to reduce impacts to emergency response and fire suppression services from new development.
- **IS-P27. Parks Master Plan.** In cooperation with other park service providers, the County shall establish and maintain a Parks Master Plan that would assess current facilities within each inland and coastal planning area, determine appropriate locations for new facilities, and identify funding options.
- **IS-S1. Adequate Public Infrastructure and Services Ordinance.** Adequate public infrastructure and services standards shall be used to determine the level of infrastructure and services necessary for discretionary development greater than a single family residence and/or Accessory Dwelling Unit or minor subdivision. Standards shall be specified by ordinance for County provided services. County standards shall be consistent with Plan policies. Standards for non-County services should be consistent with levels of service adopted by local service providers or, if standards have not been adopted, the County shall work in coordination with the local service providers to identify generally accepted standards.
- **IS-S3. Infrastructure Project CEQA and NEPA Land Use Consistency Determinations.**

6-1 Cont.

Policies of this Plan which avoid or mitigate environmental effects shall be considered by CEQA lead agencies and federal agencies conducting NEPA evaluations in the evaluation of the environmental impacts of proposed infrastructure projects. Policy conflicts should be considered potentially significant land use impacts pursuant to California Public Resources Code 21083 and Code of Federal Regulations Title 40, Part 6.

- **IS-S9. Street Lighting**. Where development is required to install streetlights, they shall be designed to block upward transmission of light, avoid light trespass, and achieve design illumination in prescribed areas with limited scatter.
- **IS-S10. Interim Parks and Recreation Standards.** Parks and recreation standards contained in the Government Code Section 66477 shall be used as the standard for parkland dedication in the review of divisions of land for which a tentative map is required pursuant to Section 66426, until such time that the County has established parks and recreation standards for new development that differentiate between urban and rural settings; specify acreage of park land of 3 acres per 1,000 residents; and specify land dedication, in-lieu fee, or other mechanisms to fund park and recreation improvements and funding for operation and maintenance.
- **IS-IM1. Coordination with Service Providers.** Coordinate as appropriate with special districts, cities, LAFCO, and other local service providers by reviewing and commenting on capital improvement plans, proposed spheres of influence, municipal service reviews, annexations, and changes in organization. Enter into formal cooperative relationships when appropriate to plan, fund, and implement infrastructure and service delivery projects.
- **IS-IM3. Fiscal Impact Assessment.** Prepare guidelines for the preparation and evaluation of fiscal impact assessments for large scale discretionary projects. Establish threshold criteria to identify applicable large-scale projects.
- **IS-IM16 Parks and Recreation.** Prepare parks and recreation standards for new development that consider community preference and differentiate between urban, suburban, and rural settings; specify acreage of park land per 1,000 residents; and specify land dedication, in-lieu fees, or other mechanisms to make park and recreation improvements.
- **IS-IM17. Street Lighting.** Prepare street lighting standards that allow for community- specific priorities and standards and that specify when streetlights are required based on intersection type and functional classification. Establish lighting design criteria, considering AASHTO and International Dark-Sky Association guidelines.

6-1 Cont.

Chapter 7. Circulation Element

7.2 Relationship to Other Elements

The goals and policies in this Element are directly correlated with that of the Land Use Element and Housing Element so that new and existing development will be adequately served by the transportation system, and will not interfere with existing or planned improvements. Transportation policies in this Element are also closely related to policies in the Energy Element and the Air Quality Element to minimize energy costs and air quality impacts. This Element is also directly related to the Community Infrastructure and Services

Element, which contains policies regarding infrastructure financing and level-of- service standards. The Noise Element and Safety Element also include policies and standards to address airport noise and safety issues. The requirements set forth in the Land Use Element and Safety Element also reflect the residential densities allowed near airports.

- **C-G1 Circulation System Safety and Functionality.** A safe, efficient, accessible and convenient circulation system in and between cities, communities, neighborhoods, hamlets, and adjoining regions taking into consideration the context-specific needs of all users*, consistent with urban, suburban, rural or remote community character.
- **All users is defined in the Complete Streets Act to include: motorists, pedestrians, bicyclists, children, persons with disabilities, seniors, movers of commercial goods, and users of public transportation, in a manner that is suitable to the rural, suburban, or urban context of the general plan.*
- **C-G3. Interagency Cooperation.** Coordinated planning between the County, transportation system service providers and HCAOG for improved system design, development, operations, and maintenance.
- **C-P2. Consideration of Land Uses in Transportation Decision Making.** Transportation decisions shall be based on a comprehensive planning approach that considers existing land uses, principally permitted land uses and future land development as proposed in adopted County plans and plans of other governmental agencies.
- **C-P6. Jurisdictional Coordination and Integration.** Use HCAOG, formal Memorandums of Understanding, and informal project level cooperation to integrate county-wide transportation planning and implementation efforts.
- **C-P7. Joint Use of Traffic Models.** The County-Wide Transportation Plan (CWTP) and projects with potentially significant transportation impacts should integrate transportation planning through joint use of area-wide traffic models, including but not limited to the Greater Eureka Area Travel Model (GEATM) or the Humboldt County Traffic Demand Model (HCTDM). Develop travel demand models with methods and inputs that incorporate walking, biking and transit. Support coordination with agencies to maintain the accuracy and utility of such models
- **C-P8. Coordination Between County Agencies.** County Public Works shall coordinate with Planning and Building and consider suggestions from other County departments to encourage uniform implementation of the Circulation Element and County-Wide Transportation Plan.
- **C-P9. Circulation Planning for Bicycles, Pedestrians and Transit.** Circulation planning and project review shall include an assessment for bicycle, pedestrian and public transit access.
- **C-P13. Acceptance of Roads into the County Maintained Road System.** Circulation Element roads, as specified by the County-Wide Transportation plan, shall be recommended to the Board of Supervisors for inclusion into the County Maintained Road System. Other roads shall not be recommended for acceptance into the County Maintained Road System unless an exception for public interest is supported by Public Works and adequate funding for the future maintenance of the road and its associated facilities is provided.

6-1 Cont.

- **C-P15. Roadway Functional Classifications.** Adopt and consistently apply roadway design and right-of-way standards as part of a County-Wide Transportation Plan according to functional classifications that consider all modes of travel in the context of road location and applied usage, e.g. urban, suburban, rural or remote.
- **C-P16. Prioritization of Investments.** Use objective criteria consistent with this Plan that can be applied uniformly and county-wide to prioritize transportation capital and maintenance expenditures. Work to reduce overall deferred maintenance liability. Subject to state law, maintenance of existing roads shall be a priority.
- **C-P17. Highway Improvements.** Encourage state and federal highway improvements that promote safety and connectivity for all users, especially for communities with highway arterials. The County supports a strategy for safety and operational improvements to the U.S. Highway 101 Safety Corridor that is implemented in a manner consistent with the General Plan.
- **C-P20. State and Federal Consistency.** Road construction and maintenance activities shall be consistent with and support approved state and federal salmon or steelhead recovery plans, Clean Water Act Total Maximum Daily Loads (TMDLs), and the National Pollution Discharge Elimination System Stormwater Program.
- **C-P25. County-Wide Transportation Plan**. The County shall maintain a clear plan for development and improvement of multi-modal transportation infrastructure consistent with land use plans, intended community character and community priorities.
- **C-P26. Investment in Improvements.** The County's Capital Improvement Plan shall be consistent with the County-Wide Transportation Plan. It will prioritize, assess and address existing road conditions consistent with the goal of increasing the safety, network functionality and facility efficiency, and capacity for all modes. The level of service and quality of service for all users shall not be diminished, and where practical, shall be increased when expanding roadway capacity for motorized circulation. Road resurfacing projects should provide improved access and safety for bicycles.
- **C-P30. Landscape Buffer Strips**. The County Wide Transportation Plan shall provide landscape buffer strip standards as part of the road cross-section standards and according to the urban, suburban, rural and remote context. Landscape buffer strips should be used, where feasible, to segregate pedestrian walkways from arterial and collector roadways.
- **C-P32. On-Street Parking**. Design on-street parking to minimize conflicts with all users consistent with the County-Wide Transportation Plan. Where appropriate, creative on-street parking arrangements such as parking pockets or bays shall be considered to improve design flexibility.
- **C-P33. Design Standards for All Pathways**. Design standards appropriate to urban, suburban, rural and remote character shall be used by the County Public Works Department for the design and construction of pedestrian and bicycle facilities. **C-S2. Neighborhood Connectivity.** Local roads shall be planned to allow for orderly development of the community. Standards for neighborhood connectivity shall be those specified in Title III - Land Use and Development Division 2 Subdivision Regulations. Connectivity standards shall govern:

6-1 Cont.

1. Intersection spacing
2. Block sizes
3. Cul-de-sacs and dead-end roads
4. Secondary access requirements
5. Gated communities and other restricted access roads
6. Access connections between local, connector and arterial roads
7. Pedestrianandcyclingconnections
8. Construction and connection of street "stubs," to adjacent parcels

The Department of Public Works shall approve all road alignments.

- **C-S3. Traffic Thresholds of Significance.** Apply objective measures, such as roadway capacity and level of service from the Transportation Research Board Highway Capacity Manual or its equivalent, to make determinations on the significance of traffic impacts for CEQA purposes.
- **C-S5. Prioritizing Transportation Capital Expenditures.** Objective criteria shall be used to prioritize transportation capital expenditures. Criteria shall be developed to reflect consideration of:
    - Accident data and multi-modal traffic engineering safety analysis for safety projects.
    - System preservation.
    - Multi-modal LOS and Quality of Service (QOS) measures for congestion relief projects.
    - Analysis of future development potential based on the Housing Element land inventory for growth accommodating projects.
    - Reductions in roadway system maintenance costs.
    - Community demand and public interest.
- **C-S6. Prioritizing Road Maintenance Projects.** Use and refine the PCI rating system to prioritize road maintenance projects for roads that have been assessed under this system.
- **C-S7. Transit, Bicycle, and Pedestrian Quality/Level of Service Standards.** Bicycle and pedestrian Quality of Service and Level of Service Standards shall be specified in County code land use planning purposes. The County shall reference Transit Level of Service standards specified in the Public Transit Service Element of the Regional Transportation Plan as amended.
- **C-S9. Prioritization of Pedestrian and Bicycle Facilities and Routes.** Objective criteria shall be used to prioritize construction of pedestrian and bicycle facilities and routes. Criteria shall be developed to reflect consideration of:
    - Providing safe and continuous connections between:
        - Neighborhoods and public schools; and
        - Residential areas and workplaces, shopping districts, daily retail and social services; and
        - Transit stops and public facilities; and
        - Adjacent open spaces or recreation areas.
    - Reductions in motorized vehicle miles traveled.
    - Community demand and public interest.

1. **C-IM1. County-Wide Transportation Plan.** The County shall adopt a clear plan for development and improvement of multi-modal transportation infrastructure consistent with land use plans, intended community character and community priorities in unincorporated Humboldt County. The plan will include a review and

6-1 Cont.

update of roadway, pedestrian, and bicycling facility standards in the Humboldt County Roadway Design Standards Manual, Title III—Land Use and Development Division 2 Subdivision Regulations, and other appropriate ordinances. The plan shall be reviewed and updated as needed.

2. **C-IM4. Regional Coordination**. Support and participate in joint circulation system and land use planning with HCAOG, affected cities, Caltrans, and other transportation agencies and providers.
3. **C-IM9. Adoption of Water Quality and Stream Habitat Protection Measures.** Formally adopt and maintain the Five County "Water Quality and Stream Habitat Protections Manual for County Road Maintenance", or its equivalent, to guide the following activities:
    1. Routine and emergency road repair
    2. Maintenance of County roads and related facilities, including actions taken to prevent erosion and/or the deterioration of a roadway, such as activities affecting the cutbank, road surface, fillslope, and all drainage structure
    3. Maintenance and replacement of bridges and culverts
    4. Activities on County-owned maintenance yards
    5. Measures to protect the traveling public, such as snow and ice removal
4. **C-IM15 Municipal Advisory Committee Review.** The County shall utilize the municipal advisory committees in those areas where they exist when updating community plan circulation components.

C-IM18. Congestion Relief Planning and Implementation Program. The County shall utilize the best available traffic information, including the Humboldt County Travel Demand Model, other models and plans, and transportation impact analyses to identify roads that are currently capacity constrained or projected to become capacity constrained at some point as a result of General Plan implementation, and shall work cooperatively with HCAOG, Caltrans, applicable cities, HTA, or other agencies to implement a coordinated traffic management strategy to plan and prioritize transportation demand measures and roadway improvements to reduce roadway congestion along such roadways. 6-1 Cont.

The County shall use state and federal transportation improvement funds available directly to the County or through HCAOG, other grant funds, project related exactions, other available County funds, and impact fees to fund congestion relief improvements.

The following steps shall be taken to address specific capacity limitations:

- Monitor vehicle trips and other modes of travel at regular intervals.
- Solicit public involvement in transportation improvement planning prior to implementing any improvements.
- Identify transportation demand management measures that could be applied to the areas served by the specific roadway(s) to reduce peak-hour vehicle trips and congestion, such as:
    - *Coordinate with school districts to expand school bus operations, create a "walking school bus" program, create programs for shared rides to school, or other programs to reduce school-related vehicle trips;*
    - *Coordinate with transit providers to identify strategies to improve and expand bus service and encourage ridership;*

    - *Coordinate with businesses served by the roadway(s) and encourage the use of appropriate transportation demand measures to reduce employee-related vehicle trips;*
    - *Identify bicycle and pedestrian enhancements that improve the ability of motorists to shift short trips to non-motorized modes.*
- Use the following roadway and intersection improvements, as appropriate, in combination with "E" below, to accommodate additional traffic volumes while providing a safe multi-modal circulation system:
    - *Public education*
    - *Signage*
    - *Stop signs*
    - *Traffic signals or roundabouts*
    - *Traffic signal timing changes and signal coordination*
    - *Striped turn-lanes*
    - *Turn movement prohibitions*
    - *Bulb-outs and chicanes*
    - *Change stop sign location of two-way stop signs at four-way intersections to reduce unwarranted stops on parallel alternative routes*
    - *Develop parallel routes or make parallel routes into couplets*
- Implement the following measures in a stepwise manner to provide additional vehicle capacity on existing two-lane roads:
-

1. *Within the existing curbs, provide a two-way left turn lane (2WLTL), two travel lanes, and up to two parking lanes when space permits – provides a capacity of up to 16,000 vehicles per day.*
2. *Provide 2WLTL, two travel lanes, two bike lanes, and up to two parking lanes when space permits (usually a parking lane needs to be removed to add bike lanes) - provides a capacity of up to 16,000 vpd.*
3. *Identify parallel alternate routes with available traffic capacity to which some of the excess traffic can be diverted and utilize intersection improvements listed in "D" above to encourage drivers to divert to identified alternate routes.*

6-1 Cont.

F. If transportation demand management measures and capacity improvements located within the existing two-lane cross-section have been demonstrated to be inadequate:

1. *Consider accepting a lower level of service;*
2. *Within the existing curbs, provide four lanes consisting of two travel lanes and no parking - provides a capacity of up to 20,000 vpd. Note: Although a four-lane undivided roadway section provides more capacity than two lanes and one 2WLTL, the section with a 2WLTL is considered safer.*
    1. *Within the existing curbs, same as above but with a.m. and p.m. peak hour left turn prohibitions into driveways and side streets - provides a capacity of up to 22,000 vpd.*
    2. *Within the existing curbs, same as above but with a.m. and p.m. peak hour left turn prohibitions into driveways and side streets; widen curbs to provide left turn pockets at key intersections – provides a capacity of 24,500.*
3. *Consider widening the curbs to provide additional travel lanes, bike lanes, 2WLTL, medians, parking lanes, and sidewalks, all as needed to meet demands.*

Chapter 13. Noise Element

Noise levels are considered in the Land Use Element to avoid direct conflicts between neighboring uses and to establish patterns of land uses that minimize noise exposure. Policies in the Circulation Element related to road location, design, and non-motorized transportation can affect traffic noise levels. Policies of the Housing Element and Open Space Element also reflect noise considerations.

Traffic Noise

Traffic noise depends primarily on the speed of traffic and the percentage of truck traffic. The primary source of noise from automobiles is high-frequency tire noise, which increases with vehicle speed. In addition, trucks and older automobiles produce engine and exhaust noise, and trucks generate wind noise.

As illustrated in Table 13-B, Humboldt County is primarily subject to noise impacts from U.S. Highway 101, which creates noise in areas up to 500 feet away. Differences in elevation can amplify or dampen noise levels; for example, noise from a thoroughfare in a trough or valley between residential areas will be reflected upward and focused while noise from an elevated thoroughfare may dissipate. On flat ground, a buffer, such as a sound wall or dense vegetation, will greatly reduce noise escaping to surrounding areas. The California Department of Transportation (Caltrans) sometimes installs sound walls along state roads when new construction or widening is proposed. In Humboldt County, Caltrans has not pursued sound wall construction along existing highways.

- **N-G2. Incompatible Land Uses.** Land uses arranged to reduce annoyance and complaints and minimize the exposure of community residents to excessive noise.
- **N-P2. Guide to Land Use Planning.** Evaluate current noise levels and mitigate projected noise levels when making community planning and zoning decisions to minimize the exposure of community residents to nuisance noise levels. Minimize vehicular and aircraft noise exposure by planning land uses compatible with transportation corridors and airports, and applying noise attenuation designs and construction standards. Avoid zoning patterns that permit people to "move to the nuisance" unless mitigated through project conditions or recorded notice.
- **N-P4. Protection from Excessive Noise.** Protect persons from existing or future excessive levels of noise which interfere with sleep, communication, relaxation, health or legally permitted use of property.
- **N-S3. Environmental Review Process.** For noise sensitive locations where noise contours do not exist, the environmental review process required by the California Environmental Quality Act shall be utilized to generate the required analysis and determine the appropriate mitigation per Plan and state standards. Future noise levels shall be predicted for a period of at least 10 years from the time of building permit application.
- **N-S4. Noise Study Requirements.** When a discretionary project has the potential to generate noise levels in excess of Plan standards, a noise study together with acceptable plans to assure compliance with the standards shall be required. The noise study shall measure or model as appropriate, Community Noise Equivalent Level (CNEL) and Maximum Noise Level (Lmax) levels at property lines and, if feasible, receptor locations. Noise studies shall

6-1 Cont.

be prepared by qualified individuals using calibrated equipment under currently accepted professional standards and include an analysis of the characteristics of the project in relation to noise levels, all feasible mitigations, and projected noise impacts. *The Noise Guidebook* published by the U.S. Department of Housing and Urban Development, or its equivalent, shall be used to guide analysis and mitigation recommendations.

- **N-IM7. Highways Noise Contours.** Request Caltrans to update current and projected noise contours for highways.

Arcata General Plan

The City is currently working to update the General Plan.

Visit the Strategic Infill Redevelopment Program page to learn more and for details on how you can get involved.

The Arcata General Plan will help shape how the city of Arcata will look, function, provide services, and manage resources for the next 20 years. The plan is the City's "constitution" for physical development and change within the existing and future city boundaries. The plan is a legal mandate that governs both private and public actions. The general plan is atop the hierarchy of local government laws regulating land use. Other laws and policies, such as specific plans, subdivision regulations, and the zoning ordinance are subordinate to, and must be consistent with, the general plan. Comprehensive in scope, the plan conveys the fundamental values that public decision-makers will use to guide the City's evolution, from its physical development to the ever-changing network of services provided to its citizens.

6-1 Cont.

Authority & Purpose of the General Plan

California State law requires cities and counties to prepare and adopt a general plan. The Government Code Sections requiring general plans are listed and summarized in the box on the following page.

Planning Commission & City Council Review & Adoption

The City of Arcata Planning Commission conducted public hearings and reviewed the Draft General Plan prepared at the direction of the City's General Plan and Specialized Task Forces. They forwarded a Planning Commission Draft to the City Council. After conducting their own public hearings, the Council adopted this General Plan on October 4, 2000.

TRANSPORTATION ELEMENT

- Minor Arterials. Local streets, while providing access to development on adjacent lands, primarily provide mobility between arterial and collector streets. Examples include Buttermilk, **Jacoby Creek (within the sphere of influence)** West End, Union, and Upper Bay Road.
- Rural Roads. Rural roads are generally two-lane unimproved facilities located on the outer edges of the community. Their primary function is to provide connection and access to farms, isolated residential areas, and industrial uses. Rural roads usually do not have typical urban improvements such as underground drainage, lighting, sidewalks, or curbs and gutters. Examples of rural roads in the Arcata area include Mad River Road, Upper Bay Road, Jackson Ranch Road, the western portion of Foster Avenue, and **Jacoby Creek Road**.
- T-1c Intercity travel. The **City shall coordinate with Humboldt County and Caltrans** to provide adequate facilities for vehicles, buses, and bicycles to serve intercity demand. Joint efforts may include transportation improvements outside of Arcata which serve intercity travel, such as bicycle links, timed-transfer bus stops, park-and- ride lots, and regional transit service and development of park-and-ride lots in Arcata to reduce intercity vehicular travel.

6-1 Cont.

- POLICY T-2 TRAVEL DEMAND MANAGEMENT
  Objective. Reduce the percentage of automobiles and reduce the annual vehicle-miles of travel.
- T-2a Land use development patterns. The City encourages and supports travel demand management efforts. The City shall promote land use and development patterns that encourage walking, bicycling and transit use. In recognition of the link between land use and transportation, the land use plan shall discourage low density, homogenous land-use patterns that foster automobile travel and are impractical to serve with transit. Land use planning shall emphasize high density and mixed land- use patterns which translate into higher transit and pedestrian travel in the downtown and neighborhood commercial areas. Infill, redevelopment, and reuse of underutilized property at higher densities shall be encouraged prior to outward expansion of City boundaries.
- Preserve existing and historic urban fabric
- POLICY T-4 STREETS AND HIGHWAYS PLAN AND POLICY
- Objectives. Plan an internal street system consistent with Arcata's small-town, non- metropolitan character and which: 1) efficiently utilizes existing facilities and reduces need for investment in new or expanded street and highway facilities or capacities

- Minor improvements at intersections. Minor projects to improve traffic safety include redistributing lane allocations and coordination of traffic signals. Improvement projects shall be designed to accommodate the needs of pedestrians and bicyclists.
- Maintain rural character. Rural roads **shall be maintained in a manner which will retain their rural character and discourage use as alternatives to arterials and highways for longer distance travel**.
- T-4f Traffic calming. The City shall employ the following measures to reduce speeds and "calm" traffic in the various neighborhoods:
- Neighborhood Traffic Management. A Neighborhood Traffic Management Program (NTMP) **shall be developed** to respond to problems in a consistent and methodical approach. The NTMP should be a two-phase program, with the first phase involving education and **community-driven measures**, and the second phase involving installation of restrictive physical devices in appropriate circumstances. Neighborhood residents and businesses should be invited to participate in the program so that they can evaluate the benefits and trade-offs of various measures and be involved in the decision-making process.

- T-4h Street maintenance. The Pavement Management System **shall be maintained to identify and prioritize street maintenance projects** in the City's Capital Improvement Program (CIP). The maintenance program shall include regular street cleaning and repair of pavement, sidewalks, and bicycle lanes, and pay particular attention to conditions that discourage bike usage.
- T-5f Pedestrian enhancements. Prioritize implementation of improved pedestrian facilities and enhancements in areas of the city with the greatest need including the Arcata Plaza, Westwood Center area, the Sunset Avenue neighborhood, Samoa Boulevard, Alliance Road, Spear Avenue, Janes Road in the vicinity of the Pacific Union School, and **Bayside Road in the vicinity of Jacoby Creek School**. The following pedestrian improvements and safety enhancements should be considered in future planning for these areas:
    - Close sidewalk gap.
    - Install vertical curbs to keep vehicles from parking on sidewalks. Reduce street crossing distance with curb extensions and smaller curb radii.
    - Use on-street parking as a pedestrian buffer.
      Install textured crosswalks.
      Provide adequate street lighting focused on crossings.
      Restrict parking near crosswalks to improve sight distance.
      Install rumble strips on approaches to crosswalks.
      Plant street trees or place street trees in planters in the parking lane.
      Relocate intersection stop bars five feet back from crosswalks to improve driver and pedestrian visibility.

[Note Bayside Rd??? meaning OAR? No Roundabout in priority list]

6-1 Cont.

- T-5g Pedestrian pathways and multi-use trails. Pedestrian pathways or multi-use trails for the exclusive use of non-motorized transportation modes should be provided. Pathways may be long facilities located along corridors or short facilities providing direct access through development projects or connecting areas not directly accessible by streets. Pathways should be planned to serve both recreational and commuter needs. The **following shall apply to pedestrian pathways** or multi-use trails:
    - Easement dedication. Dedication of easements for pathways through new private developments may be required.
    - **Cooperation with local and regional agencies and jurisdictions. The City shall cooperate with other agencies** to establish and maintain off-street pathways and trails utilizing creek, utility, and railroad right of way.
    - Foster Avenue Extension. Multi-use paths or trails shall be included in the Foster Avenue extension to Sunset Avenue.
    - Other Locations. Other potential locations for multi-use paths are within the North Coast Railroad right of way from Giuntoli Lane to Samoa Boulevard, along the west side of Samoa Boulevard/**Old Arcata Road east of State Route 101**, and along the perimeter of Arcata Bay towards Manila.
- The following standards **shall apply to sidewalks**:
    - Sidewalkcontinuity.Gapsinexistingsidewalksshouldbeclosedtoprovidea continuous pathway. Cul-de-sacs should be discouraged because they disrupt pedestrian connectivity.
    - Sidewalk widths. New development projects shall be required to construct or reconstruct sidewalks along the property frontage. Required widths for new or reconstructed sidewalks are shown in Table T-5.
    - Sidewalk Requirements. Where adequate width exists to maintain ADA minimum clearance, sidewalk pedestrian amenities should be provided in the downtown commercial area. These include benches, bicycle parking, pedestrian-scale lighting, street trees, flower boxes, trash receptacles, drinking fountains, and awnings. Private development projects shall be required to include sidewalk improvements; other landowners are encouraged to provide improvements.
- TABLE T-5 SIDEWALK FUNCTIONAL WIDTH REQUIREMENTS

DESCRIPTION	WIDTH
Low density residential area for two-way pedestrian traffic	6 feet
Low intensity commercial area for two-way pedestrian traffic and window shopping	8 feet
Higher density commercial and residential area for two-way pedestrian traffic, window shopping, and street furniture allowance	10 feet
Minimum width of sidewalk at bus stop with bench on sidewalk, without a shelter	8 feet
Minimum width of sidewalk at bus stop with a shelter on sidewalk	12 feet
High intensity commercial area with high pedestrian traffic and a variety of outdoor sidewalk use such as shopping and dining	

6-1 Cont.

- POLICY T-6 PARKING SUPPLY AND PARKING MANAGEMENT
- Objective. Provide an adequate supply of parking in perimeter lots downtown. Minimize the impacts of Humboldt State University parking into adjacent neighborhoods. Ensure that new development provides an adequate but not excessive supply of parking.
- T-6c Parking **standards for new development**. The City's parking standards shall be revised to specify a maximum parking ratio as well as a minimum parking ratio for new development. Parking lots should be located, where feasible, to the rear or side of commercial and multi-family residential buildings.
- T-8a Developer responsibilities and exactions. Developers shall be required to construct transportation improvements along their property frontages. Where appropriate, a **traffic impact study shall be required** which identifies on-site and off-site impacts and mitigation measures.
- Inallinstances,thedevelopershallberesponsibleformitigatinganyoff-site traffic impacts of the proposed development in a manner consistent with the policies of this plan. Measures may include a reduction in the size or density of the development; installation of pedestrian, bicycle and transit amenities to encourage alternative travel modes; or implementation of Transportation Demand Management measures.
- 2.9 IMPLEMENTATION MEASURES

6-1 Cont.

#	IMPLEMENTATION MEASURE DESCRIPTION	RESPONSIBLE PARTY	TIME FRAME
LU-1	Amend LUC to Incorporate Street Standards Add Street Standards to City's LUC (formerly LUDG)	Community Devel. Dept.	Year 1
T -1	Create Neighborhood Traffic Management Program Prepare and adopt a two-phase traffic management program. Phase 1 will involve education and community-driven measures, including developing a handbook describing procedures for residents to initiate a local NTMP. At a minimum, the handbook should define the procedures for initiation, types of data to be collected, a toolbox of measures, a method for establishing priorities, and potential funding mechanisms. Phase 2will involve installing traffic calming devices in appropriate circumstances.	Public Works Dept.	Year 1
T -2	Pavement Management Program A pavement management program will evaluate roadway conditions, and schedule and complete needed maintenance and repair in a timely manner.	Public Works Dept.	Ongoing
T -3	Capital Improvements Program (CIP) Include transportation improvements, including bicycle and pedestrian facilities, in the City's CIP	Public Works Dept.	Annually
T -4	Adoption of Traffic Mitigation Fee Ordinance	Public Works Dept.	Year 1

	Adopt a citywide traffic impact fee in accordance with AB 1600 to mitigate the traffic impacts.		
T -5	Develop Additional Public Parking Lot on West Side of Downtown	Community Devel. Dept.	Year 2
T -6	Develop Comprehensive Pedestrian Plan and Priorities Seek sidewalk improvement program funding.	Public Works Dept.	Ongoing
T -7	Bicycle Boulevards Provide primary bicycle corridors between major activity centers. Clearly sign all bicycle boulevards and include traffic calming measures to discourage automobiles.	Public Works Dept.	Year 1
T -8	Foster Avenue Connection Secure funding for the Foster Avenue connection, including bicycle paths.	Public Works Dept.	Year 3

HISTORICAL PRESERVATION ELEMENT

5.4 INTRODUCTION

6-1 Cont.

Arcata's Historical and Cultural Resources. For centuries before the arrival of European-American settlers in 1850, Arcata and the Humboldt Bay region were the home of the Wiyot. An Algonquian-speaking people, the Wiyot lived along the lower Mad River, other local streams, and along Humboldt Bay. Their way of life was shaped by the remarkable surroundings of forested hills, bountiful streams and rivers, and the Pacific and Bay shores, which generously provided for both their survival and cultural needs.

Humboldt Bay was located by European-Americans for the first time in 1849. The discovery of gold in the Trinity and Klamath River regions resulted in large numbers of settlers coming to the area. The displacement, disease, violence, and cultural disintegration accompanying white settlement brought almost total annihilation to the Wiyot peoples. Today, the Wiyots are, for the most part, associated with three Humboldt Bay area rancherias. They are involved in various tribal economic projects and in the revitalization of cultural traditions such as language, basket weaving, ceremonies, and reclaiming ancestral lands.

Arcata, first known as Union, was settled in the spring of 1850 as a supply center for the interior mining districts

Guiding Principles and Goals.

- Promote preservation of structures and sites that are representative of the various periods of the city's social and physical development.

- Encourage owners of eligible structures to seek historic landmark status and to invest in restoration efforts.
- Conserve the many examples of early residential building styles found in the city's older neighborhoods, from Bayside to Arcata Height
- Assure that new construction and additions to existing historically-designated buildings maintain the character and livability of the historic neighborhoods.
- Promote interest in and appreciation of the value of Arcata's history and its heritage of historic buildings.
- Prevent destruction of archaeological and cultural resources and assure that any artifacts receive proper disposition.

5.5 POLICIES

The Historical Preservation Element contains the following policies:

1. H-1 Historic Landmarks
2. H-2 Noteworthy Structures
3. H-3 Arcata Plaza Area Historic District
4. H-4 Neighborhood Conservation Areas
5. H-5 Controls on Demolitions of Structures
6. H-6 Public Participation, Information, and Education Policy
7. H-7 Archaeological and Cultural Resources

6-1 Cont.

POLICYH-1 HISTORICLANDMARKS
Objective. Designate and preserve significant structures and sites that are representative of the city's social and physical development; that are reminders of past eras, events, and persons important in local, state, or national history; which provide significant examples of architectural styles of the past; or which are unique and irreplaceable assets to the city, and the neighborhood in which the structure or site is located.

- H-1a National Register and State Historic Landmarks designations. The City encourages owners of eligible structures to request National Register and State Historical Landmarks designations for their properties. As of 1998, three National Register sites have been designated: the Arcata Hotel (on the Plaza), the Whaley House (14th and H Streets), and the Schorlig House (1050 12th Street). The Jacoby Storehouse is among the State Registered Historical Landmarks. **[The Old Jacoby Creek School is the only national registered historic property in BAYSIDE CA]**
- H-1b Local Historic Landmarks designations. Structures or sites having special character or special historic, architectural, or aesthetic interest or value shall be designated as

local Historic Landmarks. Such structures or sites shall be protected from demolition and inappropriate alterations. Locally designated Historic Landmarks are shown in

Figure HP-a and are listed in Table HP-1, at the end of the Element. An updated inventory of structures and sites eligible for designation as a Local Historic Landmark shall be maintained by the City. One or more of the following criteria shall be required for a structure or site to be eligible for listing:

1. The building or site is particularly representative of a distinct architectural period, type, style, or way of life.

2. The building is of a type or style which was once common but is now rare. 3. The building is at least 50 years old.
4. The building or site is connected with a person or event important to local history.

6. The building's style, construction method, or materials are unusual or significant.

7. The overall effect of the design or building details are beautiful or unusual.
8. The building contains original materials or workmanship of high or unusual value.

6-1 Cont.

4. H-1e Design review approval for alterations and additions. The following types of changes to a structure designated by the HL combining zone shall not be permitted without first obtaining approval of the Historic and Design Review Commission:

1. Anyexteriormodificationsoralterations,includingchangesinmaterials.
2. **Interioralterationsthatwouldaffecttheexteriorappearance.**
3. Anyadditiontothedesignatedstructure.
4. ConstructionofanewbuildingonaparcelwithadesignatedHistoricLandmark.

- H-1f Design criteria for alterations of and additions to local Historic Landmarks. At the discretion of the Community Development Director and/or Historic and Design Review Commission, an owner proposing any construction or alteration that may affect the historical character of the structure may be required to obtain an analysis of the proposed changes by a cultural resources consultant **or other knowledgeable professional to determine the impact on the building's historical features**

- H-2a Noteworthy structures list. The City shall direct the Historic and Design Review Commission to recommend and keep current a “Noteworthy Structures” list, and encourage retention of these structures. Noteworthy structures are those which may not have complete documentation as to their historical or architectural merit but which have notable characteristics. In order to be eligible for listing, a structure should have one of the following attributes:

- 1. Representativeofaparticulararchitecturalstyle.
  2. Representativeofaperiodinthecity'shistoricaldevelopment.

- 3. Associatedwithsocialhistoryofthecity.
  4. Ofunusualorspecialdesigncharacter.

6-1 Cont.

POLICYH-4 NEIGHBORHOODCONSERVATIONAREAS(NCAs)ANDSPECIFIC PLANS

Objective. Designate the Central Arcata, Arcata Heights, Bayview, and **Bayside** areas as Neighborhood Conservation Areas and assure that new construction, modifications or alterations of noteworthy structures, **and significant changes to other structures are harmonious with the existing character** of these neighborhoods.

- H-4a Neighborhood Conservation Areas. The following NCAs, with the boundaries
- shown in Figure HP-b, are hereby established:
- 1. Bayview Conservation Area.
- 2. ArcataHeightsConservationArea
- 3. Central Conservation Area

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POLICYH-6 PUBLICPARTICIPATION,INFORMATION,ANDEDUCATIONPOLICY

Objective. Promote public awareness of the City's historical heritage and resources, provide information and education about the methods and techniques to protect and enhance the quality of these resources, and **encourage public participation** in preserving Arcata's historical heritage.

POLICY H-7 ARCHEOLOGICAL AND CULTURAL RESOURCES
Objective. **Protect and preserve Native American and Euro-American archeological sites** and cultural resources within the City of Arcata.

- H-7a Cultural Resources Project Review. As part of the environmental and project review process, the City of Arcata shall enter into a Memorandum of Agreement (MOA) with the Northwest Information Center of the Historical Resources Information System of the State of California. Under the MOA, all proposed discretionary projects under the California Environmental Quality Act shall be subject to cultural resources sensitivity review by the Northwest Information Center. In order to provide a context for city projects, for the evaluation of cultural significance and for the interpretation of the results of cultural resources project reviews, the City of Arcata shall contract for a general prehistoric, ethnographic, and historic overview of the city and its environs.
- H-7b Archaeological Surface Reconnaissance. If the cultural resources project review determines that the project is located in an area with a high probability of archaeological resources, an archaeological survey by a professional archaeologist or other qualified expert shall be performed.

H-7c Mitigation of potential impacts on archeological resources. If the results of the surface reconnaissance show that the project area contains a resource of cultural significance, and if it is demonstrated that a project will cause damage to such a resource, the City may require reasonable efforts to be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. Examples of other treatment include, but are not limited to, the following:

1. Modifyingtheprojecttoavoidportionsofthesitewitharchaeologicalresources.
2. Providingorconveyingeasementsorotherdeedrestrictions.
3. Cappingorcoveringarchaeologicalresourceswithasoillayerbefore construction.
4. Planningopenspacetoincorporatearchaeologicalsites.

- H-7f Discovery of archeological resources. Upon discovery of archeological or paleontological materials, all grading or other land-disturbing construction activities at the site shall be suspended until the nature of the cultural resources has been ascertained and the appropriate disposition method determined.

6-1 Cont.

6.4 INTRODUCTION

NOISE ELEMENT

The Noise Element is one of the seven required General Plan Elements that must be prepared by California cities and counties (Government Code Section 65302). The

California General Plan Guidelines state that the Noise Element of the General Plan provides a basis for comprehensive local programs to control and abate environmental noise and to protect citizens from excessive exposure. The Noise Element is required to identify and appraise noise in the community and follow the guidelines adopted by the Office of Noise Control in the State Department of Health Services. Local governments must analyze and quantify noise levels, and the extent of noise exposure, through actual measurements or the use of noise modeling.

The air into which noise is emitted, and on which it travels, is a common resource of the community. It is a public good and as such its use, as well the responsibility of maintaining it, belongs to everyone.

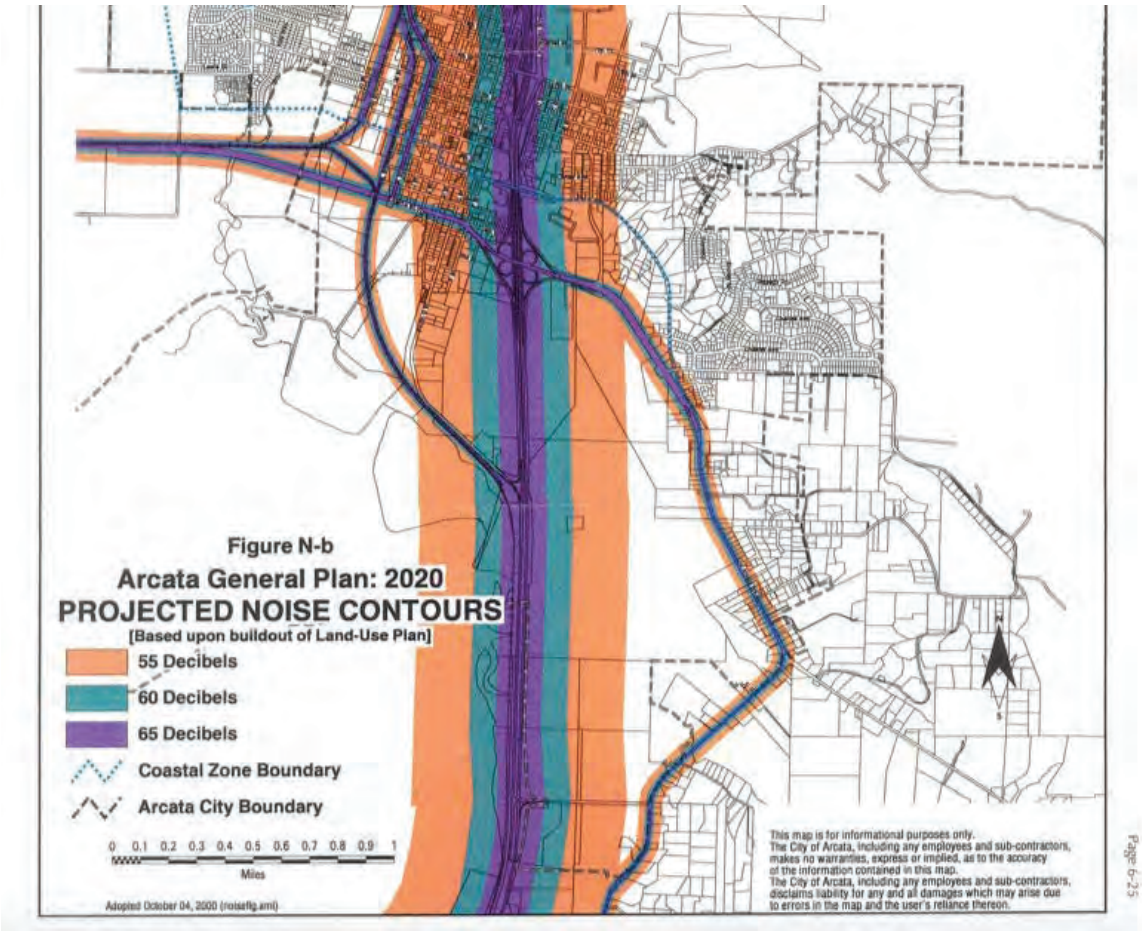
THE STATE OF CALIFORNIA GENERAL PLAN GUIDELINES* FOR THE FUNDAMENTAL GOALS OF THE NOISE ELEMENT ARE:

- To provide sufficient information concerning the community noise environment so that noise may be effectively considered in the land use planning process. In so doing, the necessary groundwork will have been developed so that a community noise ordinance may be utilized to resolve noise complaints.
- To develop strategies for abating excessive noise exposure through cost-effective mitigating measures in combination with zoning, as appropriate, to avoid incompatible land uses.
- To protect those existing regions of the planning area whose noise environments are deemed acceptable and also those locations throughout the community deemed "noise sensitive."
- To utilize the definition of the community noise environment, in the form of CNEL or Ldn noise contours as provided in the Noise Element for local compliance with the State Noise Insulation Standards. These standards require specified levels of outdoor to indoor noise reduction for new multi-family residential constructions in areas where the outdoor noise exposure exceeds CNEL (or Ldn) 60 dB.

(*Appendix A of the Guidelines)

Loud noise is a health issue.

6-1 Cont.



6-1 Cont.

- Responsibilities of a Noise Element. The Noise Element advances the ethic that a low- noise-level environment is a common resource that can be enjoyed by all, and that noise generated by some has the potential to negatively affect others. The Noise Element provides a mechanism for evaluating and mitigating the potential effects of noise on the community. It identifies potential noise sources that exceed acceptable standards and noise sources that may be considered annoying. It also provides criteria for determining acceptable noise exposure. **The California General Plan Guidelines state that the Noise Element will be as detailed as necessary to describe the local situation and mitigate local noise problems**. This means that the City is not limited to applying noise controls and noise reduction techniques to projects and other activities requiring City review and permits, but can address other noise generating activities in the community.
- There also seems to **be a pattern of governmental agencies responding to noise complaints with little or no enforcement** or action against noise violations. This pattern may be as typical of Arcata as other urban settings. To address this issue, procedures and educational materials are being developed, including a noise control manual.

- POLICY N-1 NOISE ATTENUATION
- Objective. Reduce, or eliminate, noise impacts at their source by providing enclosures, barriers, and other on-site noise attenuation measures for noise generating activities. Monitor noise levels to ensure that acceptable noise levels are maintained on adjacent sites.
- N-1b Noise attenuation guidelines. Noise attenuation measures and stationary noise source controls **shall follow the guidelines provided in the technical document entitled: Noise Control Manual** (which is considered an implementation measure).
- N-2c Noise created by new or proposed stationary noise sources. Noise created by new or proposed stationary noise sources, or the expansion or alteration of an existing use, **shall be mitigated** so as not to exceed noise level standards (Table N-1) at noise-sensitive land uses. All noise generators not in compliance with these standards will be encouraged to mitigate impacts.

TABLE N-1 – NOISE STANDARDS FOR NEW PROJECTS AND RETROFITS

LAND USE	EXTERIOR			INTERIOR		
Noise Level Descriptor	7am-7pm	7-10 pm	10pm-7am	7am-7pm	7pm-10pm	10 pm-7am
Residences, Transient Lodging, Hospitals, Nursing Homes						
Hourly L_{eq}	55 dB	50 dB	45 dB	45 dB	40 dB	35 dB
Maximum	75 dB	75 dB	70 dB	65 dB	65 dB	60 dB
Auditoriums, Theaters, Libraries, Schools, Churches						
Hourly L_{eq}	55 dB	55 dB	n/a	40 dB	40 dB	n/a
Maximum	75 dB	75 dB	n/a	60 dB	60 dB	n/a

1. The City can impose noise level standards which are up to 5 dB less than those specified above based upon determination of existing low ambient noise levels in the vicinity of the project site.
2. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).
3. The standards will be applied at the outdoor activity areas of the receiving land use, and at the building facade for upper floor receivers which do not have an outdoor activity area facing the noise source. Where no outdoor activity area is identified, the City has the option to apply only the interior noise level performance standards.

6-1 Cont.

POLICY N-3 TRANSPORTATION NOISE SOURCES AND LEVELS

Objective. Establish acceptable noise levels, for land uses and activities, that will protect community residents from the harmful effects of excessive noise exposure due to transportation noise sources. Maintain interior and exterior noise standards that will achieve land use compatibility with respect to community noise.

- N-3a New development of noise-sensitive land uses. New development of noise receptors will not be permitted in areas exposed to existing or projected levels of transportation noise exceeding levels specified in Table N-2, unless exterior noise or noise levels in interior spaces can be reduced to meet City Standards (Table N-2).
- N-3b Transportation noise. Transportation noise sources shall be periodically measured, and significant increases mitigated, so as not to exceed the levels specified in Table N-2 for outdoor activity areas or interior spaces of existing receptors.

TABLE N-2 - MAXIMUM ALLOWABLE TRANSPORTATION NOISE SOURCES EXPOSURE

LAND USE	OUTDOOR ACTIVITY AREAS[1] L_{dn}/CNEL, dB	INTERIOR SPACES	
		L_{dn}/CNEL,dB	L_{eq}, dB2
Residential	603	45	–
Transient Lodging	604	45	–
Hospitals, Nursing Homes	603	45	–
Theaters, Auditoriums, Music Halls	–	–	35
Churches, Meeting Halls	603	–	40
Office Buildings	–	–	45
Schools, Libraries, Museums	–	–	45
Playgrounds, Neighborhood Parks	70	–	–

1. Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.
2. As determined for a typical worst-case hour during periods of use.
3. Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.
4. In the case of hotel/motel facilities or other transient lodging, outdoor activity areas such as pool areas may not be included in the project design. In these cases, only the interior noise level criterion will apply.

6-1 Cont.

- POLICY N-4 ACOUSTICAL ANALYSIS REQUIREMENTS Objective. Establish a consistent procedure and framework for conducting and
- reviewing acoustical analyses.
- N-4a Noise-sensitive land uses. Where receptor land uses are potentially exposed to existing or projected exterior noise levels exceeding the levels specified in Table N-2 or the performance standards of Table N-1, an acoustical analysis shall be required as part of the environmental review process, so that noise mitigation may be included in the project design. An acoustical analysis prepared pursuant to the Noise Element **shall**:
-

POLICY N-4 ACOUSTICAL ANALYSIS REQUIREMENTS

Objective. Establish a consistent procedure and framework for conducting and reviewing acoustical analyses.

N-4a **Noise-sensitive land uses.** Where receptor land uses are potentially exposed to existing or projected exterior noise levels exceeding the levels specified in Table N-2 or the performance standards of Table N-1, an acoustical analysis shall be required as part of the environmental review process, so that noise mitigation may be included in the project design. An acoustical analysis prepared pursuant to the Noise Element shall:

1. Be the financial responsibility of the applicant.
2. Be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics.
3. Include noise level measurements, with sufficient sampling periods and locations, to adequately describe local conditions and the predominant noise sources.
4. Estimate existing and projected cumulative (twenty years) noise levels in terms of L_{dn} or CNEL and/or the standards of Table NI, and compare those levels to the adopted policies of the Noise Element.
5. Recommend appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element, giving preference to proper site planning and design over mitigation measures which require the construction of noise barriers or structural modifications to buildings which contain noise-sensitive land uses.
6. Estimate noise exposure after prescribed mitigation measures are implemented.
7. Describe a post-project assessment program which could be used to evaluate the effectiveness of the proposed mitigation measures.

6-1
Cont.

POLICY N-5 INTRUSIVE AND INTERMITTENT NOISE SOURCES

Objective. Protect community residents from the effects of excessive, intrusive, and intermittent noise. Set standards for intrusive and intermittent noise sources for both daytime and nighttime periods. Intrusive noise sources have a qualitative aspect that can be annoying. These sources may contain a tonal component which is absent from the existing general background noise. They may also be rhythmic, reoccurring or impulsive in nature, or comprised mainly of music or speech. Intrusive noise can result in annoyance or interference with sleep. These types of noise sources can include, but are not limited to, industrial processes, warning horns, backup alarms, and pressure release devices.

N-5a **Intrusive noise.** When intrusive noise sources have been identified, the detrimental effects (sleep interference or the potential for annoyance) shall be disclosed to neighboring receptor properties.

N-5b **Noise levels due to non-transportation sources.** Noise levels due to non-transportation sources which may be intermittent or recurring, impulsive noises, pure tones, or noises consisting primarily of speech or music, shall be subject to the criteria contained within Table N-1, with a -5 dB penalty applied to the criteria.

N-5c **Rhythmic, reoccurring, or impulsive noise sources.** When noise sources have been identified to be rhythmic, reoccurring, or impulsive in nature or comprised mainly of music or speech, they may comply with applicable noise level criteria and still be annoying to individuals. When these types of noise sources have been identified, they may be subject to additional mitigation or mediation.

6-1
Cont.

N-5d **Construction site tool or equipment noise.** The following shall apply to construction noise from tools and equipment:

1. The operation of tools or equipment used in construction, drilling, repair, alteration or demolition shall be limited to between the hours of 8 A.M. and 7 P.M. Monday through Friday, and between 9 a.m. and 7 p.m. on Saturdays.
2. No heavy equipment related construction activities shall be allowed on Sundays or holidays.

This shall apply to construction noise from tools and equipment which are subject to the review of the City, and which may affect receptor uses. This policy shall not apply to emergency work of public service utilities or by variance under a noise ordinance.

N-5e **Stationary and construction equipment noise.** All stationary and construction equipment shall be maintained in good working order, and fitted with factory approved muffler systems.

N-5f Noise Ordinance. The City of Arcata shall develop and adopt a City-wide noise ordinance. The ordinance shall contain noise level criteria consistent with the criteria contained within the noise element.

6.6 IMPLEMENTATION MEASURES

#	IMPLEMENTATION MEASURE	RESPONSIBLE PARTY	TIME FRAME
N-1	Citywide and downtown noise ordinances Adopt a citywide noise ordinance to protect public health, safety, welfare, and quiet by reducing existing noise levels and prohibiting the generation of loud noise from new sources. Amend the existing downtown noise ordinance to be consistent with Noise Element standards.	Police Department	Year 1
N-2	**Noise Control Manual** **Maintain and apply a Noise Control Manual that contains techniques for soundproofing new structures and muffling equipment and motors; promotes use of acoustic materials, barriers and setbacks; and requires acoustic analysis to determine potential noise impacts.**	**Community Development Department/ Planning Commission**	**Year 1**
N-3	Education programs The City shall maintain current information about noise monitoring and attenuation techniques effective in identifying and reducing noise.	Community Development Dept.	Ongoing
N-4	Record of noise complaints The Arcata Police Department shall maintain a record of noise complaints.	Arcata Police Dept.	Ongoing
N-5	Noise reduction inquiry procedure The City recognizes that many noise issues can be resolved before they get to the complaint stage, if there is a procedure for airing the issue with an impartial third party.	Community Development Dept.	Year 1

6-1 Cont.

The lead agency and the responsible agencies are required to be consistent with all of these requirements, policies, Goals, Objectives and procedures as in the selected examples in this letter. Shall is not a term used when there is an option. Shall means the Lead Agency will be required by law to make sure the requirement is carried through from start to completion.

Sincerely,

Marc Delany

Resident [redacted]

Cc: All the agencies listed in the DEIR, our elected officials, the Secretary of the Interior and the state oversight agencies for California's Historic Preservation Office

Attached: The audio file of the required Historic Design Committee's public hearing on this project. Due to the Vice Chair unfamiliarity with the Brown Act, and the City of Arcata's Protocol Ordinance requirements to allow 3 minutes for each speaker, the public's right to be heard was eliminated for this project. The 2017 public hearings that the City of Arcata is relying on were for a project described differently. This 2021 project announced in January of this year with a Mitigated Negative Declaration as the Initial analysis goal cannot rely on a 4-year-old public process, or meetings held by residents among a few property owners, as this DEIR is attempting to do. Full scoping meeting with the agencies and public together would seem something easy to understand and complete in a timely manner. Unfortunately, none of the agencies, officials, or staff has so far to date. I would like the Lead Agency to be clearly identified and that agency to start to inform the public properly.

6-1 Cont.

Thank you,

Letter 6 – Response to Comments

Response to Comment 6-1

Disagreement over CEQA lead agency, LAFCo involvement, and General Plan consistency

The commenter reiterates previously raised concerns regarding the CEQA lead agency, involvement of LAFCo, and consistency with the General Plan. Please see Response to Comment 4-8 regarding the identification of CEQA Lead Agency. Please see Response to Comment 5-7 regarding Humboldt LAFCo's responsibilities and involvement with the Project. Please see Response to Comment 2-1 and Response to Comment 46-38 regarding Project consistency with the City's General Plan. Please see Response to Comment 46-6 and Response to Comment 46-37 regarding consistency with the County's General Plan.

To: The honorable Historic Landmarks Committee
Date: 8/19/2021

I am Kiriki Delany, the owner of the historical property The Old Jacoby Creek Schoolhouse on 2212

I ask that the historical committee help with the preservation of the historical properties. The impacts on the area are understated in the report. The economic impacts of the changes because of the loss of parking, and from increased traffic noise, because the route change for all the northbound Old Arcata Road traffic, are going to impact both the current and future ability for the properties to create income, and thus manage repairs, as well as impact the historical neighborhood, and setting. 7-1

The City of Arcata is for the project. It has been clear that they are intending on this project, which has been marketed as a pedestrian and bicycle safety project. In all the meetings with the agencies, and in all the reports, there is no one that cares to preserve the historical properties in Bayside. 7-2

The round-about and the project will not help the historical properties at all. How will they help the buildings? How would a project like this protect the historical resources? This is a suburban development standard, and it does not fit with the rural character. 7-3

The reports ignore how people have historically used these roads, as well as how the historical properties remain in use. 7-4

When I purchased the property in 2007 the property was in a state of disrepair. The property was in jeopardy of being condemned. 7-5

A mega round-about will not help preserve anything historically. If you want to support historical properties, please evaluate this report with a critical eye. 7-6

I do ask that you push back on this project and ask to see all alternatives and help the property owners recognize that the impacts on the historical properties are significant, and if an alternative that that has less impacts exists, that that be chosen instead. 7-7

These affects are not isolated to 2212 Jacoby Creek, but impact the immediate neighbors at the Temperance Hall and the Bayside Grange as well. 7-8

I had a chance to read the agenda packet for todays meeting, and I have specific quotes from the report, and comments from myself compiled below. The quotes are from the report link provided to the public http://arcataca.iqm2.com/Citizens/FileOpen.aspx?Type=1&ID=3060&Inline=True

Quoted from report - "The parcel for the Old Jacoby Creek School does not have frontage directly on the proposed roundabout."

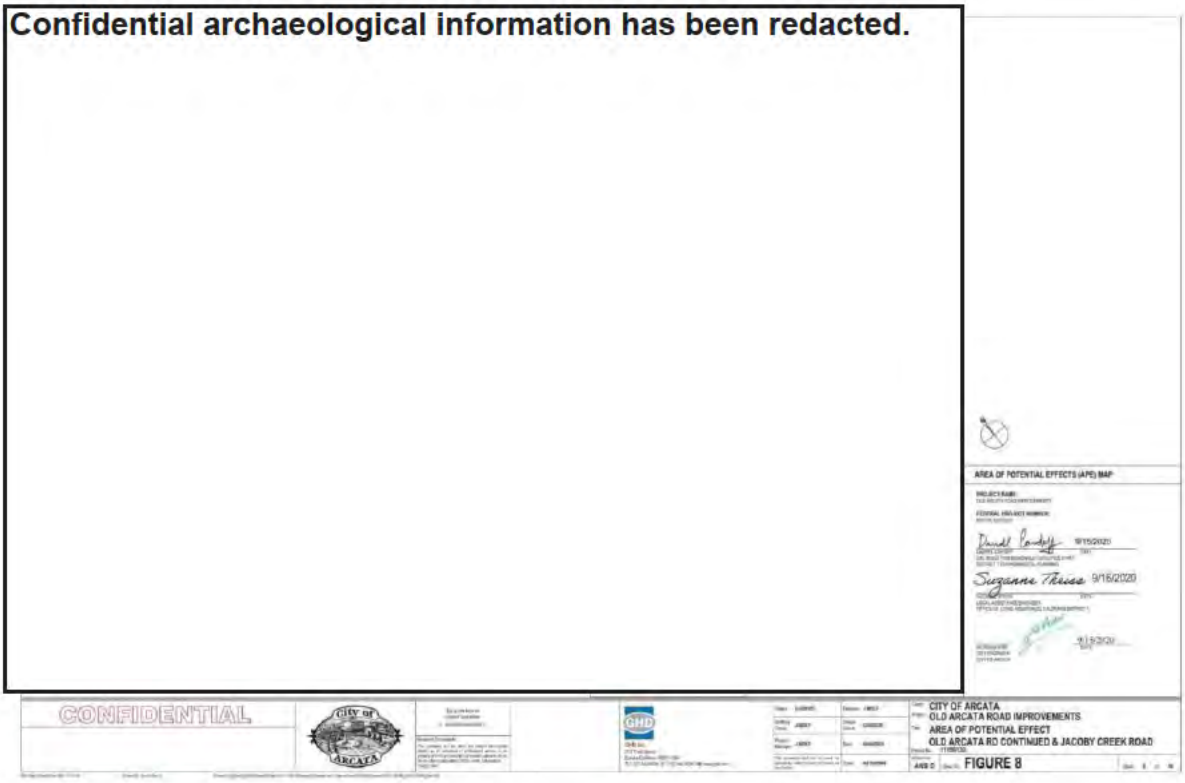
This is incorrect. The proposed roundabout project is directly in front of the property. As shown in the attached pictures. 7-9

The APE, or project area, is directly in front of 2212 Jacoby Creek. I don't think this is controversial but is obvious as presented in the plans. I am unsure why the report would characterize this property as not having frontage on the proposed roundabout. **The project has been unrealistically interpreted as having no impact outside of the APE**, because there is no removal or modifications to the existing structures. This is a very narrow viewpoint of impacts. Of course, a road project does not only impact the area it is built upon. A road and a round-about will impact all the properties that border the roundabout. Specifically with noise and light pollution, as well as substantial alterations of common areas used by the public that do affect parking and thus the economics of the buildings greatly.

2212 Jacoby Creek is clearly in the APE, and the proposed round-about is directly in front of the property.

Attachment B 5.A.b

Confidential archaeological information has been redacted.



Attachment: B. JRP 2020 HRER_2020.12.31 (2689 : Old Arcata Road HLC)

7-9 Cont.

Here is a picture of what you see when standing on 2212 Jacoby Creek and facing the project. The roundabout will be right there. The project is also not just the roundabout, but road re-alignment, and sidewalk installations. Instead of the traffic going off to the right there, it will come directly towards the property, looking at the picture you are basically looking directly into northbound traffic.

7-9 Cont.

Quoted from report - "Visibility of the proposed improvements would be impaired by the distance and the existing large trees, hedge, and other vegetation between the school and the proposed Project work."

7-10

This is incorrect, as the building is a 3-story structure, and there are views on ground level, as well as 2nd level. Of course, **landscaping and even trees are also temporary** and the round-about will not be.

The impacts to the historic resources are being downplayed and the protection two trees provide is not appropriate mitigation. This is recognition that the project site is too close to this historic resource.

7-11

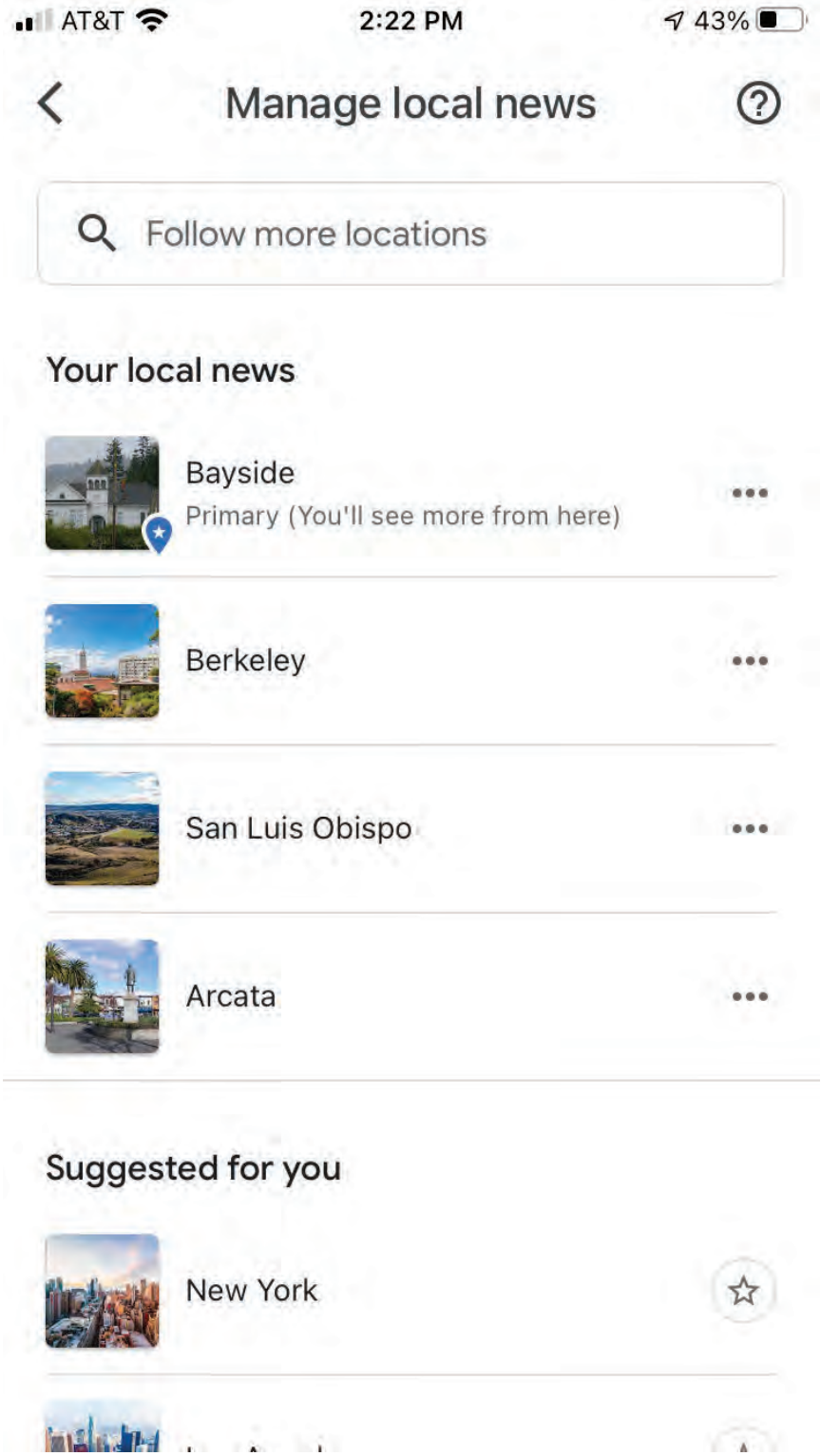
The trees and hedges currently planted of course did not exist there a mere 20 years ago. But the historic resource could last another hundred years easily. The tree's will not be living that long. Would the historic committee like a hedge or trees planted so that the views to the historical building are completely blocked from the street?

7-12

Typically, the old schoolhouse is shown in pictures when you look up Bayside. For example, search bayside on your google news and what do you see?

I urge the historic committee to preserve the views of the historic buildings.

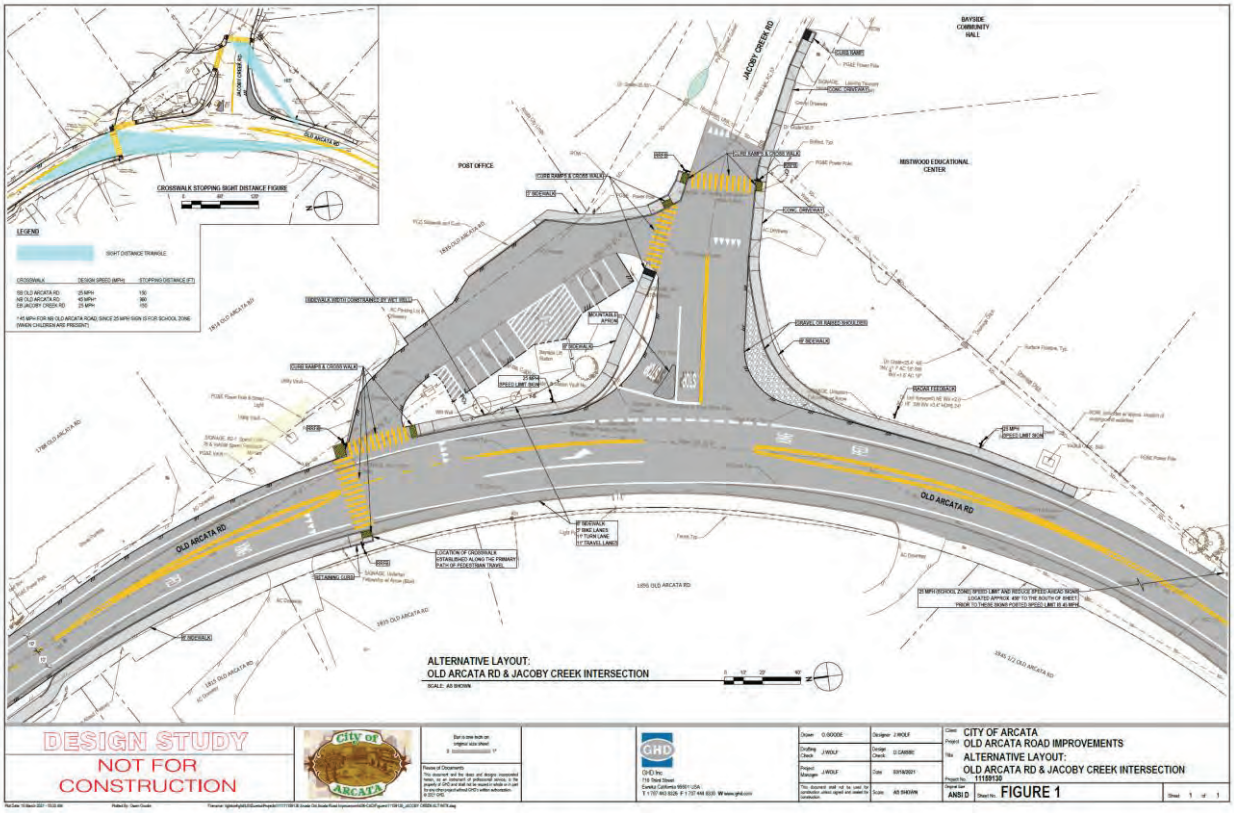
The picture below is an example of how Bayside appears in many searches about Bayside, or Bayside news.



Bayside is a community that is split between Arcata and the County. In the general plan this is discussed at length, because the Arcata side is suburban, and the county side is rural. 2212 Jacoby Creek is within the rural county side, and this is what is at the heart of the problems with this project. The historic rural Bayside, is what people recognize as Bayside. The suburban development should stay only on Arcata's side, and this is impacting historical rural properties.

We need the help of our historic committees to preserve the resource. It is not easy, and it has been very difficult dealing with the city of Arcata. As a county property we are not being governed very well. I implore the committee for relief. **County property owners deserve representation in this project. Affected county property owners do not have any representation by Arcata.** This is a major injustice to the affected county community. 7-13

This is an alternative that was developed by the City of Arcata. Would the historical committee please consider requiring the project to choose alternatives with less impact the historic properties?



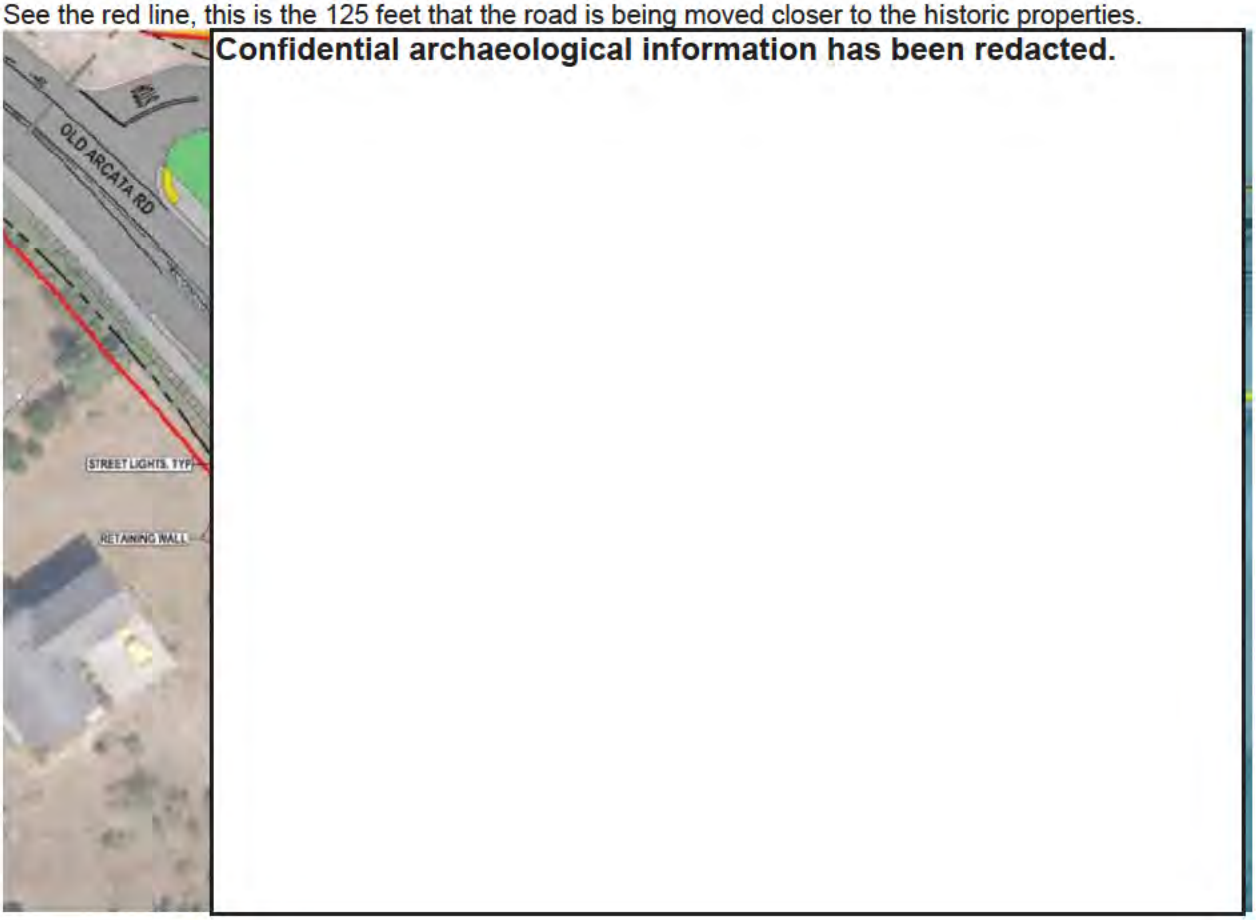
The improvements directly along the parcel frontage of the Old Jacoby Creek School would be minimal and generally consistent with the current use and appearance.

As proposed, the use of the frontage is not consistent with the current use, for parking, not as a sidewalk or walking path. It will not look anything like a rural area, it will look like a giant round-about. I invite anyone to come and review the properties and the project site in person.

In addition, these improvements would be about 125 feet from the building and other Project elements associated with the roundabout would be further away, the nearest being the concrete traffic splitter island on Jacoby Creek Road about 175 feet from the school, and the center of the roundabout approximately 250 feet from the school. Visibility of the proposed improvements would be impaired by the distance and the existing large trees, hedge, and other vegetation between the school and the proposed Project work.

The proposed Roundabout would bring all the north bound traffic that currently heads towards Arcata 125 closer, as *quoted from report - "...these improvements would be about 125 feet from the building*". This will affect the traffic noise, as well as viewshed. Considerable light pollution from the headlights of the cars shining will also reach the property.

See the red line, this is the 125 feet that the road is being moved closer to the historic properties.



7-14

Quoted from report - "by-passed section of former roadway currently used as the driveway for an informal parking area for the adjacent US Post Office."

This is also an inaccurate description. This is parking area that has historically been used by not only the PO box, but for all sorts of parking needs within the area. Frequently there is mountain bikers that head up the trails on Jacoby Creek Road which park there. There is parking from community hall events, as well as parking by city and county government vehicles.

7-14 Cont.

The entire project site is not recognizing the parking area that is being used all along OAR and Jacoby Creek Road. But this the reality is there has been ad-hoc parking used within the road right-of-way for decades. The mischaracterization of how the land has been used historically, and both presently today should be corrected in the report.

In closing I implore the committee to defend and support the preservation of the historic resources. As property owners I am protesting this project because the impacts have not been addressed. My property will be adversely impacted, as well as the properties of my neighbors.

Please act now, or risk losing the historic buildings that everyone loves so much. We need your support more than Arcata needs a round-about

Thank you.

Kiriki Delany
[redacted]

Attachment A – From the Agenda packet

Old Jacoby Creek School, 2212 Jacoby Creek Road (MR 1)

The parcel (APN 501-011-006) on which the Old Jacoby Creek School sits has frontage along Jacoby Creek Road and a by-passed section of former roadway currently used as the driveway for an informal parking area for the adjacent US Post Office. The parcel for the Old Jacoby Creek School does not have frontage directly on the proposed roundabout. The Project would not encroach into the legal parcel of this property, nor would it entail removal of any landscape feature or fencing considered character defining of the historical resource. Specific Project elements directly along the parcel frontage include an improved driveway approach, some roadway widening and slight realignment, underground storm drain, new sidewalk along a portion of the frontage, and paving and landscaping at the informal US Post Office parking area. Other Project elements at the intersection of Jacoby Creek Road and Old Arcata Road not directly adjacent to the parcel frontage that are associated with the roundabout include concrete traffic splitter islands, roundabout center island, curbs, sidewalks, streetlights, crosswalks, and landscaping.

The improvements directly along the parcel frontage of the Old Jacoby Creek School would be minimal and generally consistent with the current use and appearance. In addition, these improvements would be about 125 feet from the building and other Project elements associated with the roundabout would be further away, the nearest being the concrete traffic splitter island on Jacoby Creek Road about 175 feet from the school, and the center of the roundabout approximately 250 feet from the school. Visibility of the proposed improvements would be impaired by the distance and the existing large trees, hedge, and other vegetation between the school and the proposed Project work.

The historical significance of the Old Jacoby Creek School derives from its association with the development of Bayside and the architecture of the building. The character-defining features of the property would not be altered in any way by the Project and the general setting would remain unchanged. The visual and atmospheric changes resulting from the Project would be minimal, distant, and largely obscured from view, and thus, not cause a substantial adverse change to the historical resource. Additionally, the Old Arcata Road / Jacoby Creek Road intersection has been previously altered and is not the original configuration. The original configuration closely resembled a Y-shape with the north and south sections of Old Arcata Road coming together from different angles at a distinct point with Jacoby Creek Road. This configuration changed in 1946 when Old Arcata Road was realigned to the current sweeping curve through Bayside Corners that eliminated the need for vehicles to slow down at the intersection and allowed for higher speeds on Old Arcata Road through Bayside Corners. This type of sweeping curve improvement was reflective of the “modern” post-World War II era traffic engineering ethos of accommodating high speed motor vehicle traffic. It is a modern intersection design that is much different from the original intersection designed during the pre-automobile era. The Project, therefore, is not proposing to replace a historic intersection, but rather a modern intersection reflecting modern highway design and engineering that does not contribute to the significance of the property. Other changes in the immediate vicinity of the intersection that have occurred over time are the loss of many late nineteenth century and early twentieth century buildings and structures, and the addition of multiple newer buildings, such as the US Post Office immediately next to the Old Jacoby Creek School, constructed in 1985. These alterations have changed the setting of Bayside Corners and the immediate surroundings of the Old Jacoby Creek School since 1903 when the building was constructed, yet this property and Bayside Corners still maintain a rural feeling and setting sufficient for this property to be deemed to have integrity in 1985 when it was listed in the NRHP, and the Project would not substantially alter the surroundings such that this property can no longer convey its significance. Any potential impact would be less than significant.

Old Jacoby Creek School, 2212 Jacoby Creek Road (MR 1)

The parcel (APN 501-011-006) on which the Old Jacoby Creek School sits has frontage along Jacoby Creek Road and a by-passed section of former roadway currently used as the driveway for an informal parking area for the adjacent US Post Office. The parcel for the Old Jacoby Creek School does not have frontage directly on the proposed roundabout. The Project would not encroach into the legal parcel of this property, nor would it entail

removal of any landscape feature or fencing considered character defining of the historical resource. Specific Project elements directly along the parcel frontage include an improved driveway approach, some roadway widening and slight realignment, underground storm drain, new sidewalk along a portion of the frontage, and paving and landscaping at the informal US Post Office parking area. Other Project elements at the intersection of Jacoby Creek Road and Old Arcata Road not directly adjacent to the parcel frontage that are associated with the roundabout include concrete traffic splitter islands, roundabout center island, curbs, sidewalks, streetlights, crosswalks, and landscaping.

The improvements directly along the parcel frontage of the Old Jacoby Creek School would be minimal and generally consistent with the current use and appearance. In addition, these improvements would be about 125 feet from the building and other Project elements associated with the roundabout would be further away, the nearest being the concrete traffic splitter island on Jacoby Creek Road about 175 feet from the school, and the center of the roundabout approximately 250 feet from the school. Visibility of the proposed improvements would be impaired by the distance and the existing large trees, hedge, and other vegetation between the school and the proposed Project work.

The historical significance of the Old Jacoby Creek School derives from its association with the development of Bayside and the architecture of the building. The character-defining features of the property would not be altered in any way by the Project and the general setting would remain unchanged. The visual and atmospheric changes resulting from the Project would be minimal, distant, and largely obscured from view, and thus, not cause a substantial adverse change to the historical resource. Additionally, the Old Arcata Road / Jacoby Creek Road intersection has been previously altered and is not the original configuration. The original configuration closely resembled a Y-shape with the north and south sections of Old Arcata Road coming together from different angles at a distinct point with Jacoby Creek Road. This configuration changed in 1946 when Old Arcata Road was realigned to the current sweeping curve through Bayside Corners that eliminated the need for vehicles to slow down at the intersection and allowed for higher speeds on Old Arcata Road through Bayside Corners. This type of sweeping curve improvement was reflective of the "modern" post-World War II era traffic engineering ethos of accommodating high speed motor vehicle traffic. It is a modern intersection design that is much different from the original intersection designed during the pre-automobile era. The Project, therefore, is not proposing to replace a historic intersection, but rather a modern intersection reflecting modern highway design and engineering that does not contribute to the significance of the property. Other changes in the immediate vicinity of the intersection that have occurred over time are the loss of many late nineteenth century and early twentieth century buildings and structures, and the addition of multiple newer buildings, such as the US Post Office immediately next to the Old Jacoby Creek School, constructed in 1985. These alterations have changed the setting of Bayside Corners and the immediate surroundings of the Old Jacoby Creek School since 1903 when the building was constructed, yet this property and Bayside Corners still maintain a rural feeling and setting sufficient for this property to be deemed to have integrity in 1985 when it was listed in the NRHP, and the Project would not substantially alter the surroundings such that this property can no longer convey its significance. Any potential impact would be less than significant.

Temperance Hall, 1928 Old Arcata Road (MR 2)

The Temperance Hall – currently the Mistwood Education Center – is at the corner of Jacoby Creek Road and Old Arcata Road. The parcel (APN 501-012-012) has frontage along both roads with unpaved parking lots between the building and the roads on these two sides. The Old Arcata Road (northwest) frontage is directly along the site of the proposed roundabout. The parking area on this side is not part of the legal parcel, but within the existing public right of way The Project would not encroach into the legal parcel of this property, nor would it entail removal of any feature considered character defining of the historical resource. Specific Project elements along the parcel include an improved driveway approach on Jacoby Creek Road, some roadway widening and realignment, underground storm drain, new sidewalks, roundabout center island, concrete traffic splitter islands, curbs, streetlights, crosswalks, and landscaping. The roundabout and the road encircling it would include a portion of the parking area on the Old Arcata Road-side of the building that is in the public right of way. The

Letter 7 – Response to Comments

Comment Letter 7 is addressed to the City's Historic Landmarks Committee.

Response to Comment 7-1

Project-related impacts

The comment asserts impacts to historical resources and economics, loss of parking, traffic noise, and route changes. Please see Master Response 1 regarding statements for or against the project, and Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. Please see Master Response 3 regarding parking, Master Response 4 regarding noise, and Master Response 7 regarding historical resources. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 7-2

Lack of regard for historical resources

The commenter expresses concern that there is a lack of regard for historical resources and questions the Project's safety objectives for pedestrian and bicycle users. Please see Master Response 1 regarding statements for or against the project, Master Response 2 regarding substantial evidence, and Master Response 7 regarding historical resources. The Project is primarily located within the City limits of Arcata. Bicycle lanes are common and desired features within the City. The inclusion of improvements to bicycle facilities along Old Arcata Road is consistent with the City policy outlined in the Transportation Element and the Arcata Pedestrian and Bicycle Master Plan. The walkway would be a continuation of the existing walkway along the northern portion of Old Arcata Road and thus consistent with the character of the area. These upgrades would promote pedestrian and bicycle use within the project corridor and provide an alternative to vehicular travel. Similarly, the roundabout would improve traffic flow, reduce traffic speeds through the intersection, integrate with pedestrian and bicycle safety, and improve local drainage. All hardscaped and landscaped features would be designed to blend in with the existing visual setting of the community. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 7-3

Historical properties; rural nature of community

The commenter states that roundabout will not help or protect historical resources. Please see Master Response 7 regarding historical resources and Response to Comment 46-9 regarding evaluation of aesthetic impacts. Please also see Master Response 1 regarding statements for or against the project. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 7-4

Historic road use and use of historic properties

The comment asserts "the reports" ignore how people have historically used roadways involved in the Project. The historic and contemporary setting and use of historical properties was evaluated in the Historic Resources Evaluation Report prepared for the Project (JRP 2020). Please see Master Response 7 regarding historical resources.

Discussion of historic road use is in Section 3.4 (Cultural Resources - Historic Context), pages 3.4-1 and 3.4-2. Chapter 3.4 of the DEIR is intended to analyze environmental impacts to historical resources. Thus, it does not present complete histories of the historical resources or a complete historic context. More specific information regarding the use of the roads in the project area and historical resources in the APE are in the

HRER. The City has clarified the location of the pertinent analysis in the EIR. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 7-5

Disrepair of unspecified property

The comment references disrepair of an unspecified property. Please also see Master Response 1 regarding statements unrelated to environmental issues as defined under CEQA. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 7-6

Conflict between roundabout and historical resources

The comment states a “mega-roundabout” will not preserve historical resources. An analysis of the effects of the proposed roundabout on historical resources is presented in Section 3.4 (Cultural Resources), pages 3.4-15 through 3.4-17. The City has clarified the location of the pertinent analysis in the EIR. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 7-7

Project Alternatives

The comment asserts opposition to the Project and requests consideration of alternatives to the Project. Please see Master Response 1 regarding statements for or against the project. Alternatives to the Project are discussed in Section 4 of the DEIR. As included in Section 4.5 of the Alternatives Analysis (page 4-15), the environmental impacts of the Project and Alternative 2 (Modified T-Intersection) were found to be equivalent. The City has clarified the location of the alternatives analysis in the EIR. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 7-8

Historical resources – Temperance Hall and Bayside Grange also impacted

Please see Master Response 7 regarding historical resources. The impact analysis completed in Section 3.4 did consider both Temperance Hall and Bayside Grange and concluded neither property/building would be impacted by the Project.

Response to Comment 7-9

Historical resources

The commenter is questioning the proximity of the Old Jacoby School building relative to the roundabout and potential impacts to historical resources located outside the APE. The Old Jacoby Creek School (2212 Jacoby Creek Road) has frontage on Jacoby Creek Road east of the roundabout, and along the post office parking lot driveway. According to Project design plans, at its closest point, this parcel would be separated from the proposed roundabout by the post office driveway and a grassy strip of land between the parking lot and roundabout. Thus, the DEIR is correct is saying that the parcel does not have frontage directly on the proposed roundabout. There are proposed Project elements in the right of way directly in front of the Old Jacoby Creek School, but not the roundabout. The DEIR acknowledges that the roundabout will be visible from this Old Jacoby Creek School. Please refer to Section 3.4 (Cultural Resources), pages 3.4-15 and 3.4-16 for an analysis of the Project’s impact on this property, including regarding changes to the setting of the Old Jacoby Creek School.

Economic impacts are not an environmental issue as defined in the CEQA Appendix G Environmental Checklist, and parking will continue to be available in the general vicinity. Please see Master Response 3 regarding parking. There does not appear to be a foreseeable future impact to the Old Jacoby Creek School that can be correlated with a reduction in parking. For such an impact to occur, the proposed change in parking for users of this property would need to result in a severe modification of behavior such that operations at the former school would shift in dramatic ways that lead to neglect of the property such that its historic integrity of materials, workmanship, and feeling would be greatly diminished. There is no evidence to indicate that this will occur as a result of the current project. Construction of a new parking area on the parcel would likely require its own clearance under CEQA, which would result in a process that would likely result in efforts to minimize impacts to the historical resource. Please also see Master Response 7 regarding historical impacts, which includes discussion of the APE. The City has clarified the location of the pertinent analysis in the EIR. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 7-10

Historical resources

The commenter is questioning the visual buffer to be provided by trees and landscaping relative to historical resources. The statement as presented in the DEIR is objectively accurate. There are trees between the Old Jacoby Creek School and the location of the proposed roundabout that would impair visibility of the proposed roundabout from certain locations on the property. Furthermore, the school building itself is well set back from the road and project activities. Refer to Section 3.4 (Cultural Resources), pages 3.4-15 and 3.4-16 for an analysis of the Project's impact on this property, including visual impacts. The City has clarified the location of the pertinent analysis in the EIR. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 7-11

Historical resources

The commenter is stating impacts to historical resources are being downplayed, and the protection of two trees is not mitigation. The DEIR does not propose any mitigation measures and does not refer to the trees on the property as mitigation. The trees and other vegetation are discussed as part of the analysis of the visibility of the proposed roundabout from the evaluated resources. Refer to Section 3.4 (Cultural Resources), pages 3.4-15 and 3.4-16 for an analysis of the Project's impact on this property, including visual impacts. The City has clarified the misunderstanding about Project details as described in the EIR. The City has also clarified the location of the pertinent analysis in the EIR. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 7-12

Historical resources

The comment notes the lifespan of historical resources may extend beyond the lifespan existing or future vegetation. Comment noted. This comment includes a direct question to the Historic Landmarks Committee. Vegetative screening part is not presently included in the Project but can be included during final design if desired by the City Council. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 7-13

Lack of representation for County property owners

The commenter is concerned that constituents living outside City jurisdiction were not notified about the Project. The CEQA public review process does not limit public input to City residents only. The City noticed all properties within the designated radius of the project area as identified in the DEIR, as required by the City's notifying procedures. Residents within 100 feet and property owners within 500 feet were noticed, irrespective of whether or not the property was located within City or County jurisdiction. In addition, all interested parties identified on the list compiled through the five years' engagement on the project were notified by email, as were any parties that signed up for various city list-serves for CEQA projects. The City has confirmed County constituents were also noticed. No further response or modification to the EIR is provided.

Response to Comment 7-14

Disagreement with DEIR findings

The commenter asserts the Project's design is inconsistent with current uses and the rural setting of the Project Area. Please see Section 3.1 (Aesthetics) for analysis regarding visual impacts of the Project. Concerns regarding noise in proximity to the Mistwood Education Center were previously addressed in Appendix E of the DEIR (Final IS/MND, Response to Comments, and Errata). Please see Master Response 4 regarding noise. Please see Response to Comment 46-10, Item 1 regarding light-related impacts from vehicle headlights, Master Response 3 regarding parking, and Master Response 1 regarding statements for or against the project.

Comment Letter 8

From: [redacted]
To: David Loya
Cc: Netra Khatri; Delo Freitas; Karen Diemer
Subject: RE: Notice of Availability of Draft Environmental Impact Report (EIR): Old Arcata Road Rehabilitation Project
Date: Thursday, August 19, 2021 12:45:30 PM
Attachments: image005.png

Thanks a lot for the quick reply

I made the doc as a PDF in the hopes that the pictures and everything would get printed out, or circulated well.

Please help make sure the historic committee has a chance to review the alternative design option, which we had been provided with at the last public meeting at the D st community hall. 8-1

We wanted to make sure the alternative designs, showing less impacts where reviewed by the historic landmark committee.

It's in my packet.

Thanks again,

Kiriki Delany

[redacted]

From: David Loya <dloya@cityofarcata.org>
Sent: Thursday, August 19, 2021 12:39 PM
Cc: [redacted] Netra Khatri <nkhatri@cityofarcata.org>; Delo Freitas <dfreitas@cityofarcata.org>; Karen Diemer <kdiemer@cityofarcata.org>
Subject: FW: Notice of Availability of Draft Environmental Impact Report (EIR): Old Arcata Road Rehabilitation Project

Dear Chair, Vice-Chair, and HLC members (bcc'd),

Please see attached communication on the Old Arcata Road project for your meeting tonight.

David Loya (him)
Community Development Director
City of Arcata
p. 707-825-2045
www.cityofarcata.org

City Hall is open for business between 11 and 5. Starting July 1, we will be open 9 to 5.

Visitors to City Hall are required to wear a mask inside regardless of vaccination status. Thank you for complying with this local practice.

Some services, such as water bills and police services, are available on-call. Please check our website www.cityofarcata.org for the latest information on accessing City services.

Since this is an evolving situation, please visit the City's COVID-19 website for updates.

equity arcata
welcoming · safe · racially equitable
equityarcata.com

From: [redacted]
Sent: Thursday, August 19, 2021 12:29 PM
To: Netra Khatri <nkhatri@cityofarcata.org>
Cc: David Loya <dloya@cityofarcata.org>; COM DEV <comdev@cityofarcata.org>; Catarina Gallardo <cgallardo@cityofarcata.org>; Karen Diemer <kdiemer@cityofarcata.org>
Subject: RE: Notice of Availability of Draft Environmental Impact Report (EIR): Old Arcata Road Rehabilitation Project

Hello Netra and David

I have a letter for the Historic Landmarks Committee to submit.

Can you please present the attached letter. I'd like to make sure they get a chance to see affected property owner feedback before they make a conclusion.

Thank you,

[redacted]

From: Netra Khatri <nkhatri@cityofarcata.org>
Sent: Sunday, August 15, 2021 12:21 PM
Subject: RE: Notice of Availability of Draft Environmental Impact Report (EIR): Old Arcata Road Rehabilitation Project

Hello and good afternoon

Hope you all are having a wonderful weekend.

We wanted to remind you all that the Old Arcata Road Rehabilitation Project is scheduled for next week's regular Historic Landmarks Committee on 8/19/2021 at 4:00 pm.
Attached is the agenda with **ZOOM** link information and below is the link to the agenda packet.

http://arcataca.iqm2.com/Citizens/FileOpen.aspx?Type=1&ID=3060&Inline=True

Please phone/email if you need additional information.

Regards

Netra Khatri, P.E.
City Engineer
City of Arcata - *www.cityofarcata.org*
Office: (707) 825-2173
Cell: (707) 267-4287
nkhatri@cityofarcata.org

From: Delo Freitas
Sent: Monday, August 09, 2021 4:41 PM
To: COM DEV <comdev@cityofarcata.org>
Cc: Catarina Gallardo <cgallardo@cityofarcata.org>
Subject: Notice of Availability of Draft Environmental Impact Report (EIR): Old Arcata Road Rehabilitation Project

Good afternoon,

This email is to provide notice of the comment period for the Environmental Impact Report prepared for the City of Arcata's Old Arcata Road Rehabilitation and Pedestrian/Bikeway Improvement Project. This email is being sent directly to individuals who have expressed interest in receiving project updates. Notice was also provided through publication in the *Times Standard* (print date Sunday August 8th). Notice will also be provided by direct mailing to adjacent property owners and residents.

An Environmental Impact Report is an environmental document prepared per the California Environmental Quality Act (CEQA) that analyzes potential environmental impacts of a proposed project. This report builds on the analysis included in the Project's Initial Study, which also provided analysis of project impacts. Both documents are available on the City's website at the link below, under the heading titled "Environmental Review".

https://www.cityofarcata.org/720/Old-Arcata-Road-Design-Project

The public comment period of the draft document begins today, August 9th, and will end 5 p.m. on Monday September 27th. Comment on the analysis included in the Environmental Impact Report may be submitted to the City in writing to the Community Development email inbox (comdev@cityofarcata.org). Comments received before the end of the comment period will be formally responded to in writing, and will be made available on the project webpage and will be provided to the City Council with the Final Environmental Impact Report for their review prior to adoption.

The proposed Environmental Impact Report, along with any response to comments received on the draft Environmental Impact Report during circulation, will be considered by the City Council when hearing the project. The date of this hearing will be identified after closing the public comment period and evaluating comments received. You will receive notice of the date of the City Council hearing by email in advance of the meeting.

We appreciate the community's interest and involvement in this project. Summaries of community input gathered to date can be also found on the City's website at the link listed above.

Sincerely,

Delo Freitas | Senior Planner
City of Arcata Community Development Department
Planning | Housing | Economic Development
p. 707.825.2213 e. dfreitas@cityofarcata.org

Letter 8 – Response to Comments

Response to Comment 8-1

Comment provides a PDF submission of Comment Letter 7

Comment Letter 8 provides a PDF submission of Comment Letter 7, addressed above. Please see Response to Comments 7-1 through 7-14. No further response is provided.

Comment Letter 9

From: De Zig
To: Delo Freitas
Subject: Re: Notice of Availability of Draft Environmental Impact Report (EIR): Old Arcata Road Rehabilitation Project
Date: Monday, August 09, 2021 6:22:21 PM

PLEASE DO NO PUT A ROUND ABOUT AT jcr AND oar- IT IS A DEATH TRAP FOR CYCLISTS. EVEN YOUR CITY BUSSES PUSH CYCLISTS OUT OF THE CURRENT ROUND ABOUTS- I HAVE NO NUMBER TO CALL TO COMPLAIN.

If you put another obstacle in the road it will create more problems than that damn intersection does now. Tighten the intersection up to a proper T. Close off the post office exit on OAR. This is 99% of your problems. 9-1

I do not know why the city continues to think it's ok to put cyclists at risk with these dangerous round abouts.

Denise Ziegler

On Mon, Aug 9, 2021 at 4:41 PM Delo Freitas <dfreitas@cityofarcata.org> wrote:

> Good afternoon,
>
> This email is to provide notice of the comment period for the Environmental Impact Report prepared for the City of Arcata's Old Arcata Road Rehabilitation and Pedestrian/Bikeway Improvement Project. This email is being sent directly to individuals who have expressed interest in receiving project updates. Notice was also provided through publication in the *Times Standard* (print date Sunday August 8th). Notice will also be provided by direct mailing to adjacent property owners and residents.
>
> An Environmental Impact Report is an environmental document prepared per the California Environmental Quality Act (CEQA) that analyzes potential environmental impacts of a proposed project. This report builds on the analysis included in the Project's Initial Study, which also provided analysis of project impacts. Both documents are available on the City's website at the link below, under the heading titled "Environmental Review".
>
> https://www.cityofarcata.org/720/Old-Arcata-Road-Design-Project
>
> The public comment period of the draft document begins today, August 9th, and will end 5 p.m. on Monday September 27th. Comment on the analysis included in the Environmental

Impact Report may be submitted to the City in writing to the Community Development email inbox (comdev@cityofarcata.org). Comments received before the end of the comment period will be formally responded to in writing, and will be made available on the project webpage and will be provided to the City Council with the Final Environmental Impact Report for their review prior to adoption.

The proposed Environmental Impact Report, along with any response to comments received on the draft Environmental Impact Report during circulation, will be considered by the City Council when hearing the project. The date of this hearing will be identified after closing the public comment period and evaluating comments received. You will receive notice of the date of the City Council hearing by email in advance of the meeting.

We appreciate the community's interest and involvement in this project. Summaries of community input gathered to date can be also found on the City's website at the link listed above.

Sincerely,

Delo Freitas | Senior Planner

City of Arcata Community Development Department

Planning | Housing | Economic Development

p. 707.825.2213 e. dfreitas@cityofarcata.org

Due to COVID 19, the City has implemented measures to limit in-person contact. City Hall is currently closed to walk-in business. We still strive to provide the full range of city services by phone, email, and web-based services. Since this is an evolving situation, please visit the City's COVID-19 website for updates.

Letter 9 – Response to Comments

Response to Comment 9-1

Preference for Alternative 2 (Modified T-Intersection)

This comment provides recommendations for Project design, but does not comment on the content or adequacy of the Draft EIR. The commenter is opposed to the roundabout and recommends a T-design at the intersection of Jacoby Creek Road and Old Arcata Road. Alternatives to the Project are discussed in Section 4 of the DEIR. As included in Section 4.5 of the Alternatives Analysis (page 4-15), the environmental impacts of the Project and Alternative 2 (Modified T-Intersection) were found to be equivalent. Please see Master Response 1 regarding statements for or against the project, and statements unrelated to environmental issues. No further response is necessary. No revisions to the EIR are required to be made.

From: De Zig
To: Delo Freitas
Subject: Re: Notice of Availability of Draft Environmental Impact Report (EIR): Old Arcata Road Rehabilitation Project
Date: Friday, August 13, 2021 8:40:22 AM

https://nextdoor.com/p/bn3HkGhn9s4q?utm_source=share&extras=OTMwODE1MQ%3D%3D

Don't believe me? Here is a clip a cyclist posted on Nextdoor , August 4th. Northbound on Old Arcata, just past JCR at the post office at the post office side drive..

10-1

No round about will stop this behavior

On Mon, Aug 9, 2021 at 4:41 PM Delo Freitas <dfreitas@cityofarcata.org> wrote:

> Good afternoon,
>
> This email is to provide notice of the comment period for the Environmental Impact Report prepared for the City of Arcata's Old Arcata Road Rehabilitation and Pedestrian/Bikeway Improvement Project. This email is being sent directly to individuals who have expressed interest in receiving project updates. Notice was also provided through publication in the *Times Standard* (print date Sunday August 8th). Notice will also be provided by direct mailing to adjacent property owners and residents.
>
> An Environmental Impact Report is an environmental document prepared per the California Environmental Quality Act (CEQA) that analyzes potential environmental impacts of a proposed project. This report builds on the analysis included in the Project's Initial Study, which also provided analysis of project impacts. Both documents are available on the City's website at the link below, under the heading titled "Environmental Review".
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> https://www.cityofarcata.org/720/Old-Arcata-Road-Design-Project
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We appreciate the community's interest and involvement in this project. Summaries of community input gathered to date can be also found on the City's website at the link listed above.

Sincerely,

Delo Freitas | Senior Planner

City of Arcata Community Development Department

Planning | Housing | Economic Development

p. 707.825.2213 e. dfreitas@cityofarcata.org

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Letter 10 – Response to Comments

Response to Comment 10-1

The comment states opposition to the Project.

The comment expresses opposition to the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Comment Letter 11

From: David Loya
To: Jude Power
Cc: Netra Khatri; Delo Freitas
Subject: RE: Thank you
Date: Friday, August 20, 2021 10:31:14 AM

Hi Jude.

Thank you for your thoughts and participation yesterday. I believe I have a recording. I haven't been in to check to make sure the file saved. I will post the files to the project website by mid next week.

David Loya
Community Development Director
City of Arcata
p. 707-825-2045
www.cityofarcata.org

Due to COVID 19, the City has implemented measures to limit in-person contact, including limiting work hours and closing City Hall to walk in business. We still strive to provide the full range of city services by phone, email, and web-based services. Since this is an evolving situation, please visit the City's COVID-19 website for updates.

-----Original Message-----
From: Jude Power [redacted]
Sent: Thursday, August 19, 2021 8:42 PM
To: David Loya <dloya@cityofarcata.org>
Subject: Thank you

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Mr. Loya,

I spoke at tonight's Historic Landmarks Committee meeting and was appreciative of your management of the meeting process.

It is not easy to maintain decorum and fairness when items as contentious as the Old Arcata Road Project are on the agenda, but you did just that by asking that comments be limited to the Historic Landmarks issue, and by allowing each speaker exactly two minutes. Thank you!

11-1

Unfortunately, I had to leave immediately following my comments, so don't know what was said afterward. Is there a way I can access an archived audio recording of the meeting?

Thanks again for your courteous leadership, and enjoy your weekend!

Jude Power

Letter 11 – Response to Comments

Response to Comment 11-1

The comment requests access to audio recordings of the August 19th Public Meeting.

The comment regards the August 19 City Historic Landmarks Committee meeting. The City will coordinate with the commenter to provide audio of the meeting. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Comment Letter 12

From: Kathleen Stanton [redacted]
Sent: Thursday, August 19, 2021 6:35 PM
To: David Loya
Subject: 8/19/21 LHP Mtg.

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello David,
I listened to the LHP meeting this afternoon on the telephone. I dialed into the meeting (*67 1-669-900-68330) entered the meeting ID (9935 0963 5744) and waited my turn to address the committee... I guess due to my technological, Covid Computer Nohow I wasn't able to participate :(

Here are my comments for the record.
Please forward them on to the Committee.
Thank you,
Kathleen Stanton, M.A.
Historic Resources Consultant

August 19, 2021

Dear Landmarks Committee,
Today you're being asked to make a recommendation to the City Council as to whether or not there are any adverse effects to historic resources with the Old Arcata Road Rehabilitation Project which proposes a Roundabout at the intersection of Old Arcata Road and Jacoby Creek Road which is historically known as Bayside Corners. It's my professional opinion that there are adverse effects to significant historic resources at Bayside Corners despite the findings of JRP Consultants and that the Fair Argument I made to this effect still holds.

Bayside Corners is the historic nucleus of our community where we have our old Post Office (now a City landmark); the historic 1903 Jacoby Creek Schoolhouse which is listed on the National Register of Historic Places; the 1880s Temperance Hall (now the Mistwood School and recently deemed eligible by the Office of Historic Preservation (OHP) for inclusion on the National Register) and the old Grange Hall which is currently listed on the California Register and recently deemed eligible by OHP for listing on the National Register. The historic and architectural integrity of this location remains intact and it is a special place in our community. As the National Trust would say, "THIS PLACE MATTERS".

12-1

SETTING, as you may know is one of the most critical elements that defines historic integrity along with location, workmanship, design, feeling and association. For the old Jacoby Creek School, the Temperance Hall, the Grange, the Wilson House (8-33) and the Mitchell House (8-31) which are all within a thousand feet of Bayside Corners, these properties have passed the highest threshold for historic significance in the Country. The National Register is the GOLD STANDARD for recognition of historic significance. Given this prestigious historic recognition, the historic setting of these properties should not be disturbed by the construction of a modern roundabout.

According to JRP Consulting, the Old Arcata Roadway was changed over 70 years ago in the 1940s so why not change it more with a Roundabout? They missed the point that the old configuration of the road with the T Intersection in front of the Temperance Hall is still there. The old roadway remains in situ so you can see the change over time and you can see where the old General Store was located. With the introduction of a Roundabout, all this change over

time: the T-Intersection, the sweeping curve of the road and the historic juncture of Bayside Corners will be obliterated. Someone in the future who stands in front of the old Victorian School or the Greek Revival Temperance Hall will no longer be able to experience the original setting that entwines these important historic resources. 12-1 Cont.

Furthermore, the Roundabout will encroach on the front facade of the Temperance Hall and bring all the Old Arcata Road traffic to within 40 feet of the front door. How can this not be an adverse effect to the setting of a National Register property? The view shed of the Old School will also be impaired by an intrusive, modern, traffic circle that is 108 feet in diameter with three 35 foot wide tentacles that extend from the core like an octopus up and down Old Arcata Road and eastward up Jacoby Creek Road. 12-2

Many Bayside residents want to see the Alternative Plan developed at Bayside Corners where the intersection of the historic roadway is preserved and safety elements like narrowed traffic lanes, crosswalks, wider bike lanes, concrete bulb outs and sidewalks are incorporated to facilitate a more walkable and pedestrian friendly area that successfully slows traffic, keeps people and bicyclists safe and preserves the historic integrity of Bayside Corners. This is in the best interest of our historic community and is a win-win solution where the footprint of Old Arcata Road is minimized, not expanded by an intrusive Roundabout built to primarily improve street capacity and facilitate cars. 12-3

Therefore, I ask you to make the recommendation to the City Council that they support the City's Alternative Design for road improvements at Bayside Corners and not the Roundabout Plan because the Alternative Design which was most supported by the community back in 2017 according to the SHN Report has the least negative effects to listed landmarks and the integrity of their historic setting. 12-4

Thank you for your time and attention to this very important matter for our historic community.

Kathleen Stanton, M.A.
Historic Resources Consultant
Bayside, CA

Letter 12 – Response to Comments

Comments from Comment Letter 12 were submitted by a Historic Resources Consultant. Please see Master Response 9 regarding Standards for Adequacy of an EIR and Disagreement Among Experts. Based on the comments received in Letter 12, as well as other comments submitted by the same commenter in Comment Letter 13 and Comment Letter 14 DEIR, the commenter disagrees with the City's findings specific to historical resources, prepared by JRP Historical Resources Consulting, LLC. In responding to comments raised in Comment Letters 12, 13, and 14 pertaining to historical resources, the City has fully disclosed the complete analysis and results assessed for the Project specific to historical resource and directly responded to specific technical points of disagreement raised in each comment submitted by the commentor. Please see also:

- Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion;
- Master Response 4 regarding noise and vibration (including potential vibratory effects on historical buildings);
- Master Response 7 regarding historical resources;
- Master Response 9 regarding standards for adequacy of an EIR, including disagreement among experts; and
- Master Response 10 regarding the architectural APE maps.

Response to Comment 12-1

Historical Resources

The comment states that adverse effects to historic resources at Bayside Corners will occur despite the findings of the City's consultant. Discussion of the impact to the three historical resources in the vicinity of the roundabout is in Section 3.4 (Cultural Resources), pages 3.4-15 through 3.4-17. As stated in the DEIR, the sweeping curve of the Old Arcata Road, constructed in 1946, is a design reflecting modern roadway construction practices and is not part of the "original setting" and does not contribute to the historic significance of any historical resources. The old configuration of the T-intersection is no longer intact. Reconfiguration in 1946 with the construction of the sweeping curve altered the entire intersection and destroyed the historic configuration of the intersection. The area in front of the Temperance Hall is an oblong gravel parking lot, it is not a historic roadway. The former T-junction that once was in front of the Temperance Hall is not recognizable, and there is no physical evidence of the General Store that was once situated on the other side of the original intersection. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 12-2

Historical Resources

The comment regards changes to the setting of Temperance Hall. Discussion of the impact to the three historical resources in the vicinity of the roundabout is Section 3.4 (Cultural Resources), pages 3.4-15 through 3.4-17. This analysis acknowledges that the setting will change, but it will be an alteration to a non-historic (1946) intersection that does not contribute to the significance of any historical resource. Also, setting is only one of seven aspects of integrity. Thus, if the proposed Project is constructed, the properties will all retain sufficient overall integrity to convey their historic significance and remain historical resources under CEQA. Another important fact is that before the 1946 reconfiguration of the intersection, Old Arcata Road passed within about 15 feet of the Temperance Hall front door, which is approximately 20 feet closer

than what is currently proposed with the roundabout, as designed. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 12-3

Recommendations on Project design

The comment expresses preference for Alternative 2 (Modified T-intersection). Alternatives to the Project are discussed in Section 4 of the DEIR. As included in Section 4.5 of the Alternatives Analysis (page 4-15), the environmental impacts of the Project and Alternative 2 (Modified T-Intersection) were found to be equivalent. The City has directed the commenter to the relevant impact analysis in the DEIR. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 12-4

Preference for Alternative 2 (Modified T-Intersection)

The comment expresses preference for Alternative 2 (Modified T-intersection). Alternatives to the Project are discussed in Section 4 of the DEIR. As included in Section 4.5 of the Alternatives Analysis (page 4-15), the environmental impacts of the Project and Alternative 2 (Modified T-Intersection) were found to be equivalent. It is incorrect to state a Modified T-Intersection was the preferred alternative stemming from the 2017 design charette. As stated in SHN and Omni Means (2017), *this (Modified T-Intersection) was considered acceptable by many of the participants, and was the preferred option for nearly half of all participants. Other than those who did not see modifications to the roadway, the individuals who were less supportive of this option felt that it would not do enough to reduce vehicle speeds*." Please see Master Response 7 regarding historical resources. The City has offered a correction to the commenter regarding the documented outcome of the 2017 design charette. No further analysis is necessary and no revisions to the EIR are required to be made.

Comment Letter 13

From: Netra Khatri
To: Kathleen Stanton
Cc: Susan Mcpherson
Subject: RE: Thank You
Date: Monday, September 06, 2021 3:32:46 PM

Hi Kathleen

Thank you again for reviewing the 30% design plans in detail and providing comments. See below my responses to your questions.

Please phone/email if you need additional information.

Kind regards

Netra Khatri, P.E.
City Engineer
City of Arcata - www.cityofarcata.org
Office: (707) 825-2173
Cell: (707) 267-4287
nkhatri@cityofarcata.org

-----Original Message-----
From: Kathleen Stanton [redacted]
Sent: Friday, September 03, 2021 11:23 AM
To: Netra Khatri <nkhatri@cityofarcata.org>
Cc: Karen Diemer <kdiemer@cityofarcata.org>; David Loya <dloya@cityofarcata.org>; Susan Mcpherson [redacted]
Subject: Thank You

Hello Netra,
Thank you very much for taking the time to walk the Old Arcata Rd. Corridor and Intersection with Susan and me yesterday.

We really appreciated your attention and think there are several changes that can be made to the existing 30% design that you could support and the neighborhood and school would really benefit from. Especially, providing permeable parking along the west side of the road south of the school to the intersection of OAR & JCR. 13-1

As discussed there are some flat areas on west side of the Old Arcata Road south of the Jacoby Creek school where there may be sufficient public ROW to allow for parallel parking, we will consult with our design team and consider converting the proposed bioswale/landscape with permeable surface area that will be wide enough for parking.

How can the community be assured that this change will be recommended, reviewed and implemented in the 30% design plan? 13-2

As we move forward with the next phase of the design, we will provide update to community members via project website. Ninety percent design drawings will be posted on the project website for public review. All received comments and suggestions will be reviewed by our design team and incorporated in the final design as much as feasible and meets the design standards (and of course it has to be financially feasible)

Will you put it on the Agenda for your next Transportation Safety Committee Mtg. for their review and recommendation to the Council? 13-3

We will provide an update to TSC and inform them how we plan to incorporate received comments and suggestions.

or can you bypass this process and make a recommendation directly to GHD to redesign the west side of the roadway to extend all the way out to the ROW & provide much needed parking for the neighborhood? OR Will this be a Staff Recommendation as a Condition of Approval for the project? OR? Please let me know how we can help to implement this desired outcome. 13-4

As we move forward with the next phase of the design, we will provide update to community members via project website. Ninety percent design drawings will be posted on the project website for public review. All received comments and suggestions will be reviewed by our design team and incorporated in the final design as much as feasible and meets the design standards (and of course financially feasible).

Also, many people who wanted to meet with you at Bayside Corners weren't able to attend yesterday. I was only able to give people a days notice that you'd be there so some neighbors were left out of the noticing & others couldn't get there in time. Bayside Cares really hopes you will return to mark the areas for the roundabout: roadway, apron, center circle. If you plan to, will you let Susan McPherson and me know about it so we can let others know too? 13-5

Currently we plan to mark center and east perimeter of the roundabout depicted on 30% design drawings in coming weeks, I will email you and Susan once that is complete. Hopefully we will be able to meet with you and other community members then.

Also, we discussed making the roadway for the proposed Roundabout 17 feet wide like the St. Louis Roundabout and not 21 feet wide as currently proposed. How can the community be assured that this change would be recommended, reviewed & implemented if the City Council votes to support a Roundabout? Would it be in Staff Recommendations as a Condition of Approval? OR? Again, please let me know how this could become a reality should the decision be made to build a Roundabout. 13-6

As discussed we will consult with our roundabout design expert and confirm if the lane width of the proposed roundabout can be reduced from 21 ft. to 17 ft. If feasible it will be incorporated in the final design.

Regards,

Kathleen Stanton
[redacted]

Letter 13 – Response to Comments

Responses to comments included in Letter 13 were provided in writing by the City Engineer on September 6, 2021 and are included herein.

Response to Comment 13-1

Recommendation for permeable pavement

The comment recommends incorporate of permeable pavement in specific locations. There are some flat areas on west side of the Old Arcata Road south of the Jacoby Creek School where there may be sufficient public right of way to allow for parallel parking. The City will consult with our design team and consider converting the proposed bioswale/landscape with permeable surface area that will be wide enough for parking. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 13-2

Assurances for community input into the progressing design

The commenter is seeking confirmation that additional community input will be incorporated into the remaining design process. As the City moves forward with the next phase of the design, updates will be provided to community members via the City's project website. Ninety percent design drawings will be posted on the project website for public review. All received comments and suggestions will be reviewed by the City and incorporated in the final design as much as feasible and as meets the design standards (and of course it has to be financially feasible).

Response to Comment 13-3

Transportation Safety Committee input

The commenter is asking if the City will agendize the Project for the upcoming (September 21, 2021) Transportation Safety Committee Meeting. The City did include an update on the agenda for the Transportation Safety Committee and inform them how the City plans to incorporate received comments and suggestions. However, a quorum was not reached, and the presentation was not possible. The City will continue to update the Transportation Safety Committee in the future regarding the Project.

Response to Comment 13-4

Request to modify the design to provide additional parking

The comment requests a modification of the design to provide additional parking. As the City moves forward with the next phase of the design, updates will be provided to community members via the project website. Ninety percent design drawings will be posted on the project website for public review. All received comments and suggestions will be reviewed by our design team and incorporated in the final design as much as physically and financially feasible and as meets the design standards. No changes to the design or the DEIR have been made as a result of this comment.

Response to Comment 13-5

Request for additional renderings at the roundabout

The commenter requests an additional rendering of the Project near the roundabout. The City has since worked with the commenter to mark the approximate extents of the roundabout in the field. No further response is provided.

Response to Comment 13-6

Request for a smaller roundabout

The comment requests a smaller roundabout. The City will consult with our roundabout design expert and confirm if the lane width of the proposed roundabout can be reduced from 21 feet. to 17 feet. If feasible, it will be incorporated in the final design.

Kathleen Stanton, M.A.
Historic Resources Consultant

9/27/2021

City of Arcata
736 F St.,
Arcata, CA 95521

Re: Cultural Resources Chapter Review for Historic Resources, Draft Environmental Impact Report, Old Arcata Road Improvement Project.

Dear Council and Staff,
I have reviewed the DEIR and provide my comments here in hopes that you will reconsider the proposed Roundabout and adopt the Alternative project proposed by the neighborhood group, Bayside Cares. The EIR is extremely misleading in its assertion that there are no adverse effects to historical resources or historic properties. Although CEQA, NEPA and NHPA are stand alone statutes that each have to be complied with separately, I have combined my comments to address them all. The EIR's analysis to satisfy CEQA and federal compliance for NHPA Section 106 is based on faulty and incomplete data. There are numerous errors, omissions and misstatements throughout the EIR that do not support the findings of no adverse effects to historical resources.

AREA OF POTENTIAL EFFECTS (APE)

1) The APE maps (Figures #1-#10) that delineate the project boundaries were not available for public review and were redacted from the Historic Resources Report and removed from the City of Arcata's project website.

Withholding the APE Architectural Boundary Maps (Figures #1-#10) from the public is a violation of 36CFR800.3(e) and 800.2(d) and CEQA Section 15201. Public participation is a mandated and essential component for both. Without the relevant APE maps, the public was denied basic information regarding historical resources and historic properties that are NOT confidential in nature as are the locations of sensitive tribal resources or prehistoric archaeological sites. 14-1

City planning claimed that the APE maps were "Confidential" due to archaeological resources in the APE. The APE boundaries of the Archaeological Resources were included **on the same map** as the Architectural APE boundaries for Historical Resources. APE maps do not generally show sensitive or "Confidential" archaeological site locations and prehistoric data is not required in an Architectural Survey.

The location of known and potential Historical Resources are NOT "Confidential" information and the Architectural APE Maps for Historical Resources should have been made available to the public. There is no reason to limit the public's knowledge of the locations of known and potential historical resources in the project area for analysis and comment. On the contrary, withholding the APE Maps from the public releasee undermines the public's important review and comment role under CEQA, NEPA, and the NHPA.

2) The APE was inappropriately limited to include only the roadway and a few feet of private property along Old Arcata and Jacoby Creek Roads. The APE should consist of the totality of all contiguous parcels that may be affected by the proposed undertaking. In 2017, SHN consultants produced such an APE map entitled "Old Arcata Road Improvement Project Cultural Resources Existing Conditions" that showed the roadway as an APE Area of Direct Effects and a surrounding 500 foot corridor that included adjoining parcels as the Indirect Effects APE. (See Figure 1A) 14-2

This should have been the type of APE map for CEQA & Section 106 compliance for this project. Best Practices for conducting most historical surveys includes the parcel adjacent to the immediate project area. There was no support for the creation of a project boundary that extended only a few feet onto private property. This limitation in the geographic scope of the APE appears to be arbitrary and capricious.

CalTrans and the City of Arcata determined the APE boundaries on the basis that "no physical, visual or vibration effects" were going to adversely affect potential historical resources. (pg. 3.4-11) What proof did the Lead Agencies (CalTrans and the City of Arcata) have to substantiate that there would be no adverse effects to potential historical resources throughout most of the project area that hadn't been surveyed yet? How could the lead and responsible agencies make this conclusion prior to an historic resources survey by a qualified professional? How did they limit the APE to just six parcels? What proof was there that the road improvements would have no visual effects on the setting for a potential historic property that had not yet been identified by a survey? How did they define physical effects? How did they conclude that there would be no vibration effects? 14-3

It appears that the APE was genymandered to avoid creating an effect as defined by 36CFR800.16(i). 14-4

Per the EIR, the "Project corridor" along Old Arcata Road from Bayside Road (north) to Jacoby Creek Road (south), is "outside the APE". This conflicts with the APE Maps (Figures #1 - #10) which shows the entire project area within the APE and the Architectural APE. This conflicting data and the historic survey's limited scope calls into question the validity of the consultant's survey findings and impact assessments. 14-5

3) A "pedestrian sUIVey of the **entire APE"** was conducted by one consultant on 9/10/2020 (pg. 3.4-11). However "Parcels outside the County right of way... were **not included in the** APE" (pg. 3.4-11). This suggests that the previously described "intensive" survey did not include any property within Arcata City limits, which is most of the project area. 14-6

Severely limiting the boundaries of the APE violates 36CFR800.16(d) and 36CFR800.5 and also presents an incomplete analysis of impacts under CEQA. 14-7

The EIR further describes the historical survey area as only "the area around the proposed new roundabout at Old Arcata Road and Jacoby Creek Road, including **six adjacent parcels** that could experience a visual impact." (pg. 3.4-11) The limited, six parcel survey area is inconsistent with previous statements about the consultant's "pedestrian survey of the **entire APE**" in the project area. This information about what was and wasn't surveyed in the APE is conflicting and may be misleading and is not easily understood by the public. 14-8

4) The EIR notes that the consultant's "fieldwork entailed examining and taking photographs of the resources **in and immediately adjacent to the APE**..." (pg. 3.4-11) There are no specific addresses or parcels that are identified as part of this "intensive" survey to know exactly what was surveyed and what was not. The reporting is contradictory and confusing and lacks documentation. "General" and "broad" observations were "made of the land use, surroundings, and setting." Again there is no documentation of these observations that eventually led to conclusions of No Adverse Effect to Historical Resources. (pg. 3.4-11) 14-9

The limited, six parcel survey area is not consistent with the APE Maps labeled Figures #1 - #10 which delineate an "Architectural APE" with a gold line around the entire project area from Bayside Road to the north, to Fairview and Jacoby Creek Road to the east, to 1972 Old Arcata Road to the south. This "Architectural APE" is never referred to in the text of the EIR nor were the maps identifying this "Architectural" area ever made available to the public. 14-10

To limit the historical survey to only 6 parcels at the southern end of the project area is insufficient to adequately identify the **location** of potential historical resources in the entire project area/Architectural APE or to assess the **setting** of each historic property and thus its National Register eligibility as required by Section 106. 14-11

The EIR erroneously states that "three historic-era (45 years or older) built environment resources" (2212 Jacoby Creek Road (MR 1), 1928 Old Arcata Road (MR 2), and 2297 Jacoby Creek Road (MR 3)) were noted "OUTSIDE the County right of way that are in the APE." (pg. 3.4-11). These three properties are actually OUTSIDE Arcata city limits, ADJACENT to the County right-of-way and INSIDE the County planning jurisdiction. 14-12

This is further evidence that the identified survey areas are conflicting in their scope and reporting, confusing to the public as to their locale and perhaps misleading. There were no general APE maps or Architectural APE maps available to the public to better understand where MR 1, MR 2 & MR 3 are specifically located in relation to the entire project area. Also, there is no information as to where the three other, unidentified parcels are located and why they were not considered historical resources for the purposes of CEQA. (pg. 3.4-11)

5) Two architectural properties located in the APE and Architectural APE were not surveyed or evaluated for National Register eligibility or inclusion in the California Register of Historical Resources. They include 1666 Old Arcata Road and 1972 Old Arcata Road. This violates Section 14-13

106 (36CFR60.4) and CEQA (PRC 21000, et. seq.) and the CEQA Guidelines (14CFR 15000, et. seq.) which requires lead agencies to identify, evaluate and protect individual or collective groupings of historic resources. This also violates CEQA's requirement, under PRC 21084.1, to analyze all potential historic resources that may be impacted by the Project. 14-13 Cont.

These two properties are excellent examples of Spanish Eclectic architecture (McAlester & McAlester, 1991, pgs. 416 - 429) and would qualify for the National Register given their Architectural significance (36CFR60.4 Criterion C). They embody "The quality of significance in American history (and) architecture…that possess integrity of location, design, setting, materials, workmanship, feeling and association." And per CEQA/Criteria C, they embody "the distinctive characteristics of type, period, or method of construction…" To ignore these two properties (and many others that may be eligible for the National Register) violates 36CFR60.4. which the federal agency is ultimately responsible for ensuring is completed according to the regulations. 14-14

Many other potential historical properties were ignored and not surveyed within the "Architectural APE" (APE Figures #1 - #10). Within the project area (in Arcata city limits) there are approximately 58 post war era structures that date from 1945 - 1965 which is within the actual Period of Significance. (SHN 2017 Report.) In addition, there are 19 previously identified properties that were determined eligible for inclusion in an historic district in a previous 1978 survey. (See Figure 11, An Historic Resources Inventory, Humboldt County, 1978.) 14-15

None of these properties (that are clearly eligible for inclusion in the California Register and the NRHP/CRHR under criteria A/1) were evaluated for significance at the local and state level for their association with EVENTS (the Post War, Douglas Fir Logging Boom in Humboldt County) that have made a significant contribution to the broad patterns of our history. This violates both CEQA and Section 106. 14-16

City of Arcata General Plan 2020 Violations

The EIR violates numerous General Plan 2020 statutes including:
H-1: Historic Landmarks (To designate and preserve significant structures.)
H-1b: Local Historic Landmarks Designations (Structures or sites having special character or special historic, architectural, or aesthetic interest or value shall be designated as local Historic Landmarks.)
H-2: Add Bayside to the City's Historical Resources Inventory
H-4: Designate Bayside as a Neighborhood Conservation Area
H-4f: Prepare preservation measures for historic properties in the Bayside Specific Plan District 14-17

Bayside was designated in the City of Arcata's General Plan 2020 as a Specific Planning Area (SPD) with historic significance and potential as an historic district. (H-4f) The district eligibility requirement per the land use code, had already been met and all that was missing was a survey of

individual properties to "update (the) historical resources inventory…and add Bayside to (the) inventory. (H-2)

14-17 Cont.

As the EIR reports, the survey for historic resources in the Bayside Specific Plan District was **limited to only four properties**, which was not the intent of the General Plan and violates H-2. The entire SPD per the map of the district includes properties on both sides of Old Arcata Road along much of the project area APE. (See Figure 12) Existing SPD designation was to lead to a Neighborhood Conservation Area designation which is the City's equivalent of an historic district (H-4). Furthermore, preservation measures were to be created to protect historic and noteworthy structures in these areas (H-4f). Because the boundaries of the APE were so severely limited (as previously demonstrated), no in-depth study of the built environment was conducted to "designate…(the) Bayside area as (a) Neighborhood Conservation Area." (H-4). This failed to follow the City's General Plan.

14-18

Humboldt County General Plan Violations

CU-G1: Protection and Enhancement of Significant Cultural Resources
CU-P1: Identification and Protection.
CU-P3: Consultation with other Historic Preservation Agencies and Organizations

The Connors-Lawlor-Wilson House at 1945 Old Arcata Road is currently listed on the National Register of Historic Places and was not included in the EIR report or impact analysis. (See OHP Letter 11/3/1978) This oversight violates the Humboldt County General Plan CU-G1 to protect known resources and CU-P1 to identify the potential for impacts to significant cultural resources during ministerial permit and discretionary project review.

14-19

Archival research was conducted, but there was no documented consultation with local historians or people knowledgeable about the history of Bayside which is standard practice for most historic resource surveys. This local consultation is required by the Humboldt County General Plan CU-P3. There is no record that local historians were consulted during the fieldwork to identify historic resources or that local residents were interviewed for their knowledge which would not be generally found in published secondary sources or in local annals or other archival records. (pg. 3.4-11) This oversight violates the Humboldt County General Plan CU-P3.

Historic Context - The historic context in the EIR is extremely limited in time (c.1875 to 1925) and does not represent Bayside's true Period of Significance which spans from 1860 (with the construction of the Beith House) to 1970 and includes the Post War era. The area's history does not end in the 1920s with the construction of Hwy. 101 as indicated by the EIR's limited research and reporting.

14-20

Nineteenth century Pioneer settlement associated with a burgeoning redwood industry and the transition into a modern 20th century community were certainly keystone periods in Bayside's history as reported in the EIR. Nothing, however, compared to what happened to Bayside and

Arcata between late 1945 and 1970 which might arguably be considered the most historic period of all in Bayside's 160 years. 14-20 Cont.

The social and economic transformation after the war was unprecedented and the mid-century houses are important testaments to that time. Bayside's only post war housing subdivision, Bayside Heights, (also known as "Cadillac Hill"), is in the project area on Hyland Street, but was excluded from the survey as were approximately 58 other Ranch style houses. These post war resources are the physical embodiment of the area's mid-century history and are overlooked in the CEQA analysis due to the severely limited boundaries of the APE, the limited scope of the Historic Context and the narrow and inaccurate Period of Significance identified for the resources. 14-21

Today, mid-century modern houses are receiving more and more recognition for their place in history and many for their architectural merit. These houses are now over 50 years old and date within Bayside's historic Period of Significance (1860 - 1970). Age, however, is not the only criterion for valuing these houses and may, in fact, be the least important. The how and why of these buildings that are dotted along the Old Arcata Road as infill development and celebrated as custom homes in the Bayside Heights subdivision make them highly significant within the context of a post-war United States, Humboldt County, Arcata and Bayside. This was no backwater community. It participated in the American Dream with the rest of the Country and, in fact, made a major contribution to that dream with its production of the many different wood products needed to fuel the nation-wide housing boom. 14-22

Historical Resources in the APE:

The 1882 Temperance Hall at the corner of Old Arcata Road and Jacoby Creek Road was determined eligible for the NRHP/CRHR under Criteria A/1 at the local level for its significant association with **Community Development in Bayside** and is a historical resource under CEQA. "The period of significance is 1882 to 1970." (pg. 3.4-12) This is inconsistent with the Period of Significance from 1875 - 1925 as described in the Historic Context of the EIR. 14-23

What the determination of National Register eligibility fails to establish is that the building **ALSO qualifies for its Architectural Merit**. The EIR neglects to mention that the building is an outstanding example of Greek Revival Folk Architecture. It is a very simple, redwood building with gable end returns on the west, front facade and has a relatively steep roof pitch. This front gabled shape was particularly common in New England and remained a dominant folk form well into the 20th century. (McAlester and McAlester, 1991, pgs. 90, 192, 193). The Hall was very likely built from local redwood that was logged in Bayside, brought to Bayside Corners via the small railroad on Jacoby Creek Road and milled across the street at the Flanigan and Brosnan Co. Sawmill. Its old growth redwood **materials**, its **design** & its quality **workmanship** combine to create a truly unique building unlike anything found in Arcata, Eureka or Humboldt County. 14-24

Because the building also qualifies for the NRHP/CRHR under Criteria C/3 (Architecture), any changes to the building's **setting**, the character of the property's use or a physical feature within the property's **setting** that contributes to its historic significance is considered an adverse effect per 36CFR800.5 An affect is considered adverse when properties listed in or eligible for listing in the NRHP are subjected to these type of effects. 14-25

The Hall currently possesses integrity of historical **design** and **materials** and **workmanship** that will not be adversely effected. But the **location**, the **setting**, the **feeling** and **association** with the past will be materially impaired by bringing a busy road that is currently 111 feet away from the structure to within 45 feet of the front facade. The Temperance Hall meets all seven of the criteria for historical and architectural integrity, which makes it a very strong candidate for the National Register, the gold Standard for landmark designation. 14-26

The Old Arcata Road Improvement Project proposes to construct a 106' wide Roundabout within 45 feet of the Temperance Hall that will cause a substantial adverse change to the **setting** of the resource and **materially impair its visual prominence at Bayside Corners.** The old 1903 Schoolhouse (which is currently listed on the National Register) will suffer a similar plight. Its large belfry is in direct alignment with the Old Arcata Road (as seen in the iconic, 1947 Shuster photograph, see photo 1) and this connection between the road and the school or **viewshed** will be destroyed. The traffic from the Old Arcata Road will also move approximately 73 feet closer to the property. 14-27

By removing the remnants of the old T-Intersection and replacing it with a large, 106' diameter roundabout will fundamentally change the structural layout and historical design of Bayside Corners. It's the old T-intersection which creates a "corner" to the historical location known as Bayside Corners. The current configuration of the existing intersection has been there since 1947 & dates within the Period of Significance and should not be disturbed.

The **viewshed** of the Hall's Front Facade will also be impacted. Currently there is 111 feet of open space in front of the Hall that has been there for the last 74 years. (See photo 2) The property is owned by the County and the City is requesting an Encroachment Permit from the County to use this area for the Roundabout. (See Photo 3) The project will take approximately 66 feet of this open space and put a large roundabout in its place that will come within 45 feet of the building's front facade. (See Photo 4) 14-28

The modern roundabout would be an intrusive visual element that would diminish the integrity of four of the property's significant historic features: it's **setting**, it's historical **location at Bayside Corners** (which will be destroyed), it's **feeling** and **association** and connection to a country road, Jacoby Creek Road. To realign the Old Arcata Road from its current location that is 111 feet distance from the Hall to within 45 feet is a significant adverse change mostly affecting the Hall, but also the Old 1903 Jacoby Creek School and to some degree the 1941 Old Grange Hall. (See Photo 5) 14-29

The proposed roundabout will disrupt the old neighborhood **setting** with an immense, **paved traffic circle with center island, apron and 21 foot wide roadway** encircling it, with some **other "roadway widening and realignment; new sidewalks with curbs and gutters; three concrete traffic splitters, five towering streetlights** (where currently there is just one); **and numerous street signs, four directional arrows in the center circle; and several yield signs.** (See Figure 13) The intersection will no longer feel like a country road with several historic buildings, but an urban traffic zone. (See Figure 14) 14-30

The EIR claims that the open space in front of the Temperance Hall (which has been used as a gravel parking area for the past 74 years) is historically insignificant which is erroneous. The unofficial parking area is owned by the County and was created in 1946 with the realignment of Old Arcata Road at Bayside Corners. This area provides parking for approximately 26 cars and is used frequently during school hours when students are dropped off and picked up at Mistwood Elementary School, for events at the neighboring Grange/Community Hall and for bicycle enthusiasts who park here daily to recreate in the countryside as they ride up and down Jacoby Creek Road and into the neighboring woods. 14-31

The community uses this open space for important parking that helps support the commercial viability of the Temperance Hall which has been adaptively reused as a school and for the neighboring Old Grange which is a popular community hall. Parking helps keep these buildings viable for venues that help pay for their upkeep and their cyclical maintenance. These are important resources for Bayside and the surrounding communities of Arcata and Eureka. **Parking is essential to the continued preservation and successful adaptive use of these historic properties.** 14-32

Cumulative Impacts

The original Old Arcata Road as seen in the 1919 Sanborn Fire Insurance Map of Bayside Corners shows the historic T-Intersection and its relation to the Old 1882 Temperance Hall, the 1903 Jacoby Creek School and the 1887 Bayside Store (See Figure 15). An historic photo taken about 1940 shows Bayside Corners with these three historic buildings. (See Photo 6) In 1946 the T-Intersection was reconfigured into a wide, sweeping curve that demolished the old Store and was the first adverse impact to Bayside Corners. (See photo 7) As surviving photos of the store well document, the large, ornate commercial structure was worthy of preservation and would have been eligible for the National Register for architecture, association with local events and community development had it survived like its neighboring landmarks. (See photo 8)

Because there were no environmental laws protecting historic resources back in 1947, the Bayside community lost an important landmark and prominent feature at Bayside Corners. From the surviving photos, we can see clearly what was lost; a large, Folk Victorian structure with a huge stepped parapet on the front facade that was decorated with a shingled visor supported by nine elaborate, Victorian styled brackets. Below was a full facade front porch supported with five posts with flat sawn, Victorian brackets on either side. The decorative porch continued 14-33

around the sides of the building and the central entrance had double doors that were Victorian in design flanked on either side by huge fixed windows with divided lights. In photo #9, the Wilson Family (who owned and ran the store) stand proudly in front of the imposing structure.

Although the store didn't survive the modernist movement of the late 40s and 50s, fortunately, it was the only historic loss to Bayside Corners. The Old 1903 School and the 1882 Temperance Hall survived and one is listed on the National Register and the other is eligible and will be listed as a result of the survey. The old Grange, built in 1941, is located behind the Temperance Hall is also a landmark listed on the CA Register. So these three significant historical resources and a remnant of the old, original roadway remain at Bayside Corners.

As the current Google Earth Aerial Photo shows,(see photo 7) Bayside Corners is still intact with the old T-Intersection in situ and some of the original roadway actually remains in front of the Temperance Hall. As this visual evidence shows, the claim that, "Changes to the Bayside Corners community have diminished the historic character of the area that link it to its historic past" and therefore, there are no adverse effects to historical resources is a false narrative that is not supported by the evidence of what remains at Bayside Corners. (pg. 3.4-19) The old store is gone, but this loss hasn't substantially diminished the historic significance of Bayside Corners and doesn't negate the importance of what remains and should be preserved.

14-33 Cont.

The proposed Roundabout will move the Old Arcata Road (which is now 111 feet to the west of the Temperance Hall), about 66 feet closer to the historical resource so the roadway, the traffic, the noise, the vibrations and the exhaust fumes from vehicles will come within 40 feet - 45 feet from the front facade of the old Hall. (See Photos 2, 3, 4, & 5) These are Adverse Effects per CEQA that will also negatively change the viewshed directly in front of the Hall. Similarly, with the construction of a Roundabout, the north bound traffic on Old Arcata Road will move 73 feet closer to the SW corner of 2212 Jacoby Creek Road which is the site of the 1903 Schoolhouse which is listed on the National Register. This will negatively affect the integrity of the **setting, feeling** and **association** with the past at Bayside Corners which is the historic nucleus of the community.

The effects of the past road project in 1946 taken together with the effect of the proposed road project to construct a large, urban traffic circle, or roundabout, in a rural historic landscape will significantly alter the physical location of Bayside Corners. This in turn will create changes to the **setting, feeling** and **association** of the location and the significant historical resources that reside there. These three important characteristics (that help define historic integrity) support the historic and architectural significance of the Old School and the Temperance Hall and if changed substantially as proposed, will negatively effect these historical resources.

14-34

One adverse impact to the historic integrity of Bayside Corners with the demolition of the old Store in 1947 was enough. Another adverse effect with the construction of a Roundabout within 45 feet of the Temperance Hall and 73 feet from the boundary of the Old School will create a

14-35

cumulative effect that is irreversible. Once the "Corners" is gone and replaced by a Roundabout the area will no longer reflect the historical development of the town and the old road that connected people to the historic nucleus of Bayside and the heart of the community. (See Figure 16)

14-35 Cont.

Alternative to the Roundabout

There is a better Alternative which Bayside Cares supports and it is a more sensitive change to the existing roadway that is more compatible with the historical resources at Bayside Corners. (See Figure 17) The Alternative proposes two, narrow, ten foot lanes instead of two, twelve foot lanes. The Roundabout, in comparison, has a 21 foot wide roadway. The Alternative also provides a five foot bike lane which the Roundabout does not. Sidewalks and crosswalks will be placed in more optimal areas to better support the walkability of the area and safer passage for students and the elderly who cannot navigate a Roundabout easily.

14-36

This simpler Alternative was supported by 50% of the community in 2017 as reported by SHN who conducted the public Design Charrettes. It is only because the past City Council voted to support a Roundabout with NO PUBLIC HEARING, that we are still discussing a highly controversial project that doesn't fit a community that identifies itself as rural and historic.

Respectfully submitted,

Kathleen Stanton

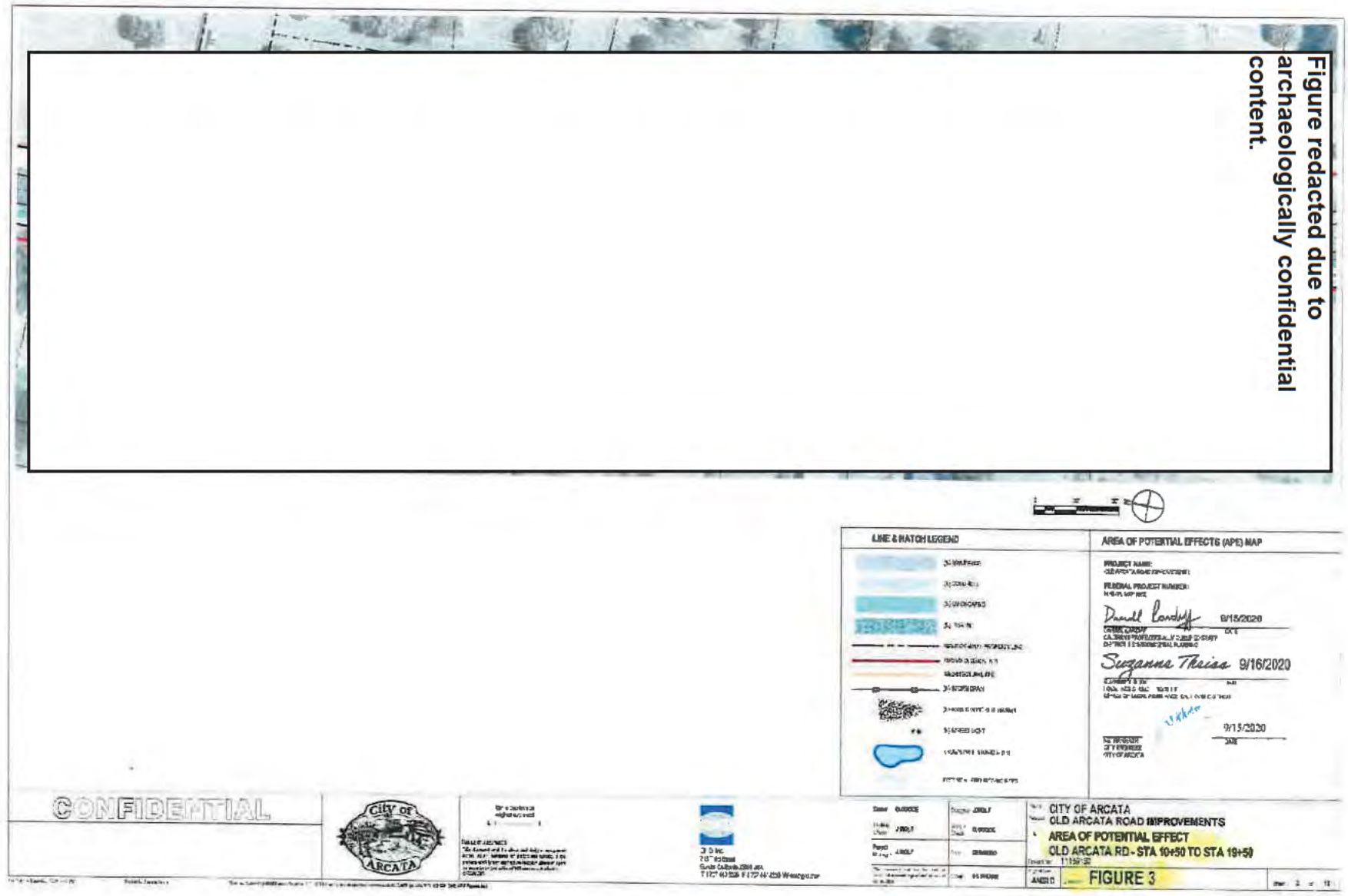
Kathleen Stanton, M.A.
Historic Resources Consultant
Bayside, CA 95524

Figure 3. APE Map

See **Sheet 10** for resources in the Architectural APE labeled with Map Reference (MR) Numbers

Figure redacted due to archaeologically confidential content.

Figure redacted due to archaeologically confidential content.



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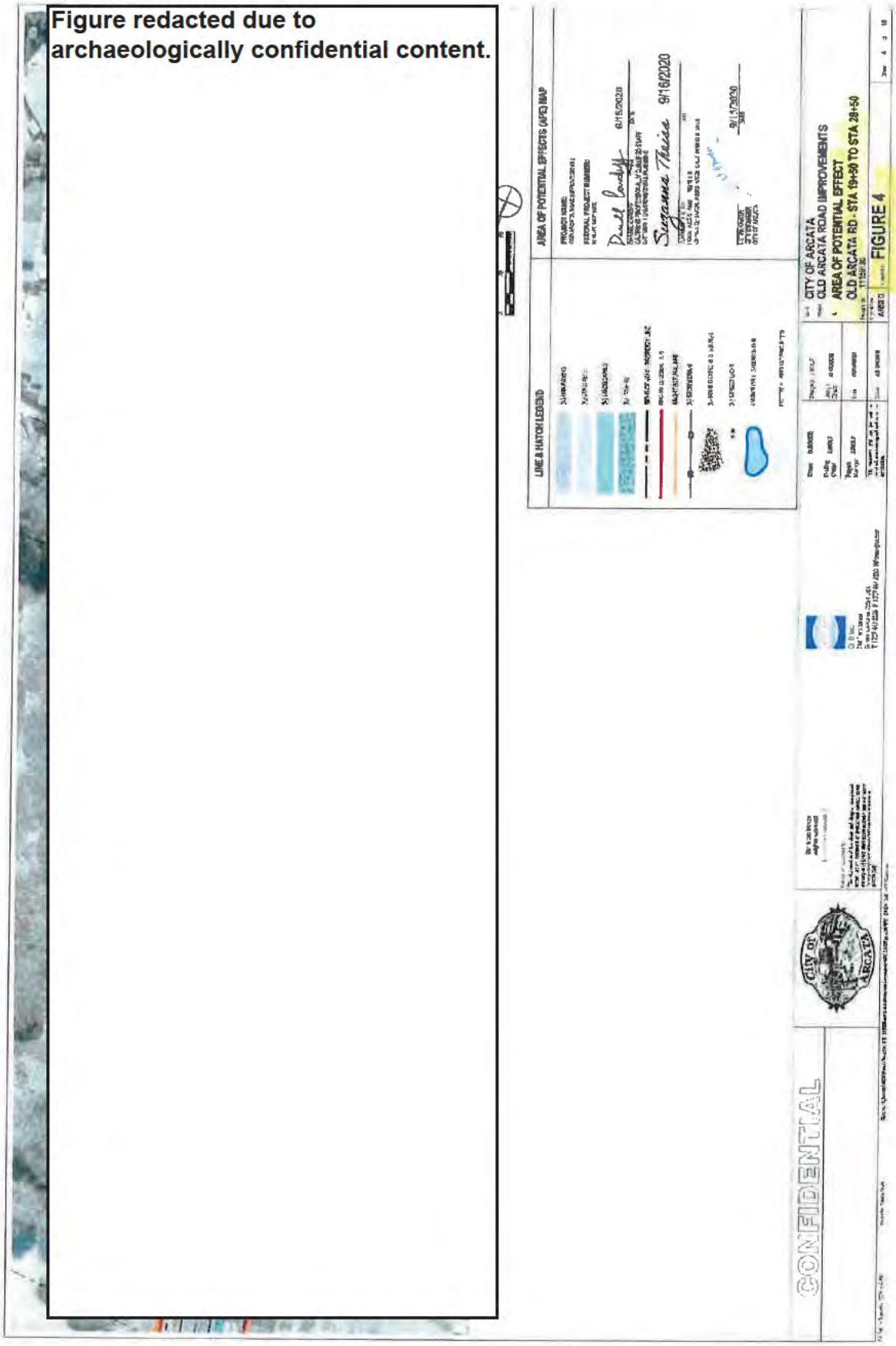

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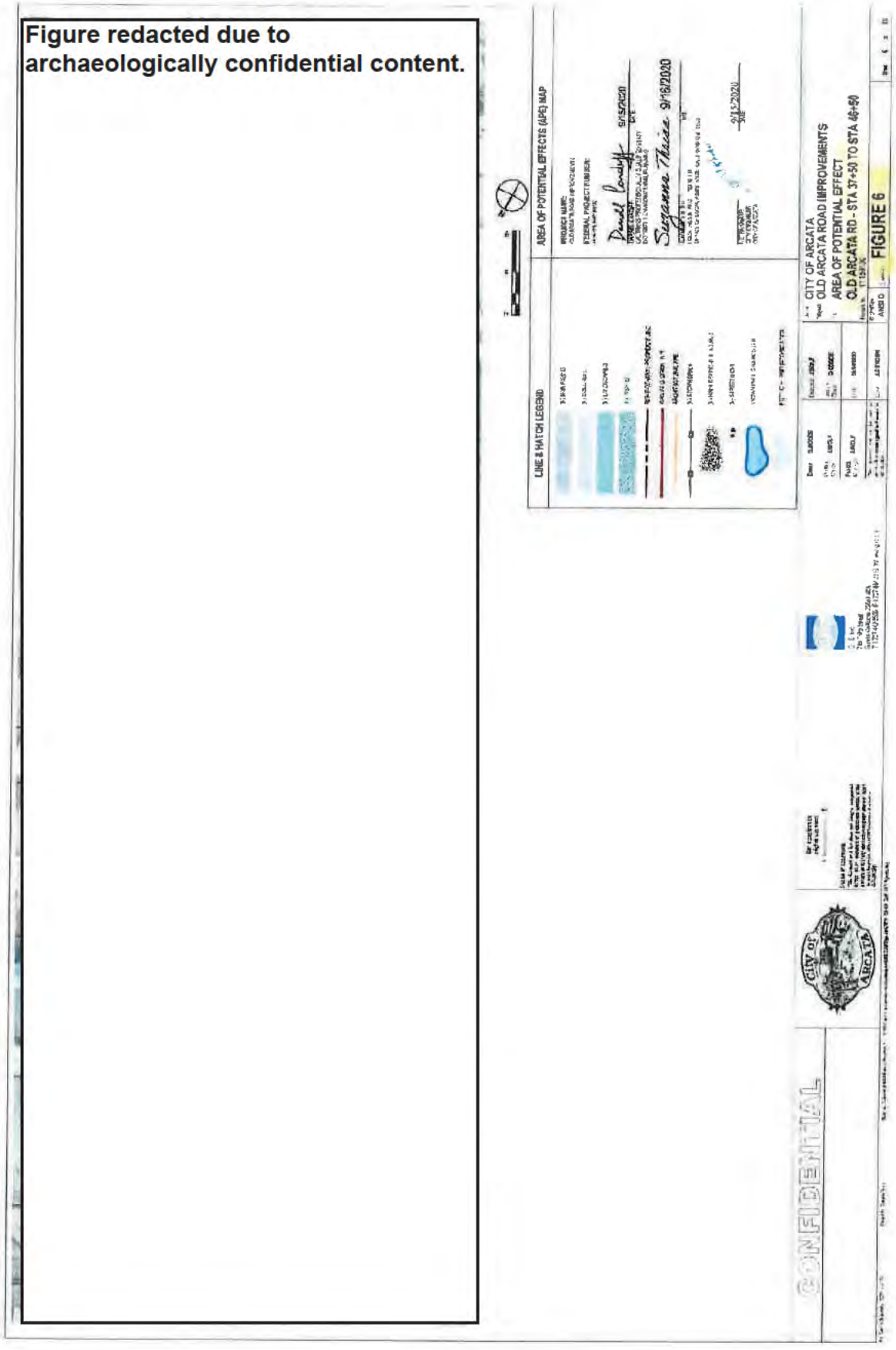


Figure redacted due to archaeologically confidential content.

LINE & HATCH LEGEND

AREA OF POTENTIAL EFFECTS (APE) MAP

PROJECT NAME:

FEDERAL PROJECT NUMBER:

Darrell Lovell 9/15/2020

Suzanne Thiesa 9/16/2020

9/15/2020

CONFIDENTIAL

CITY OF ARCATA
OLD ARCATA ROAD IMPROVEMENTS
AREA OF POTENTIAL EFFECT
OLD ARCATA RD - STA 46+50 TO STA 52+00

FIGURE 7

Figure redacted due to archaeologically confidential content.

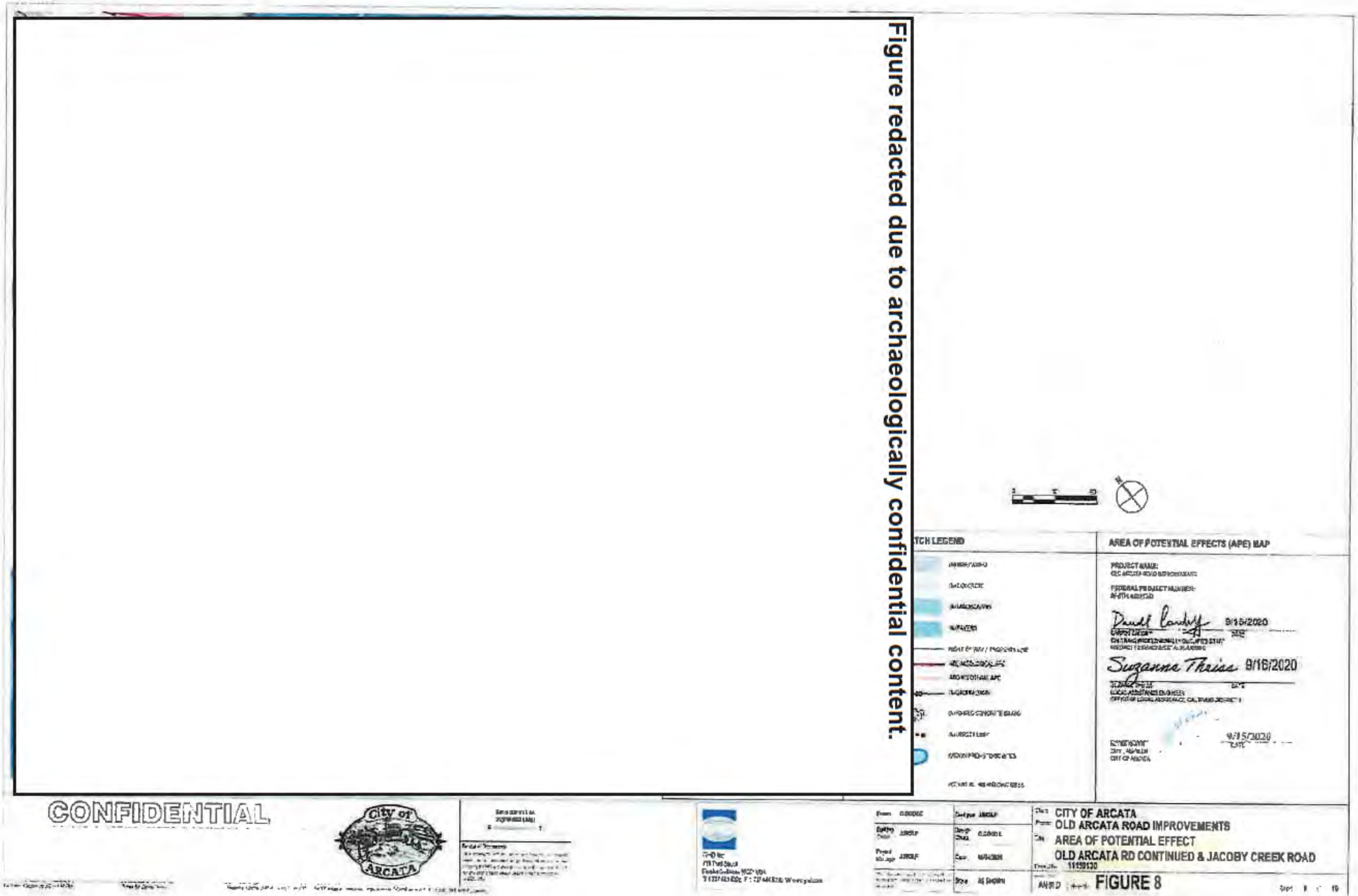


Figure redacted due to archaeologically confidential content.

LINE & HATCH LEGEND

AREA OF POTENTIAL EFFECTS (APE) MAP

PROJECT NAME:

FEDERAL PROJECT NUMBER:

Darrell Landry 9/15/2020

Suzanne Theiss 9/16/2020

9/15/2020

CONFIDENTIAL

CITY OF ARCATA
OLD ARCATA ROAD IMPROVEMENTS
AREA OF POTENTIAL EFFECT
P-12-000103

FIGURE 9

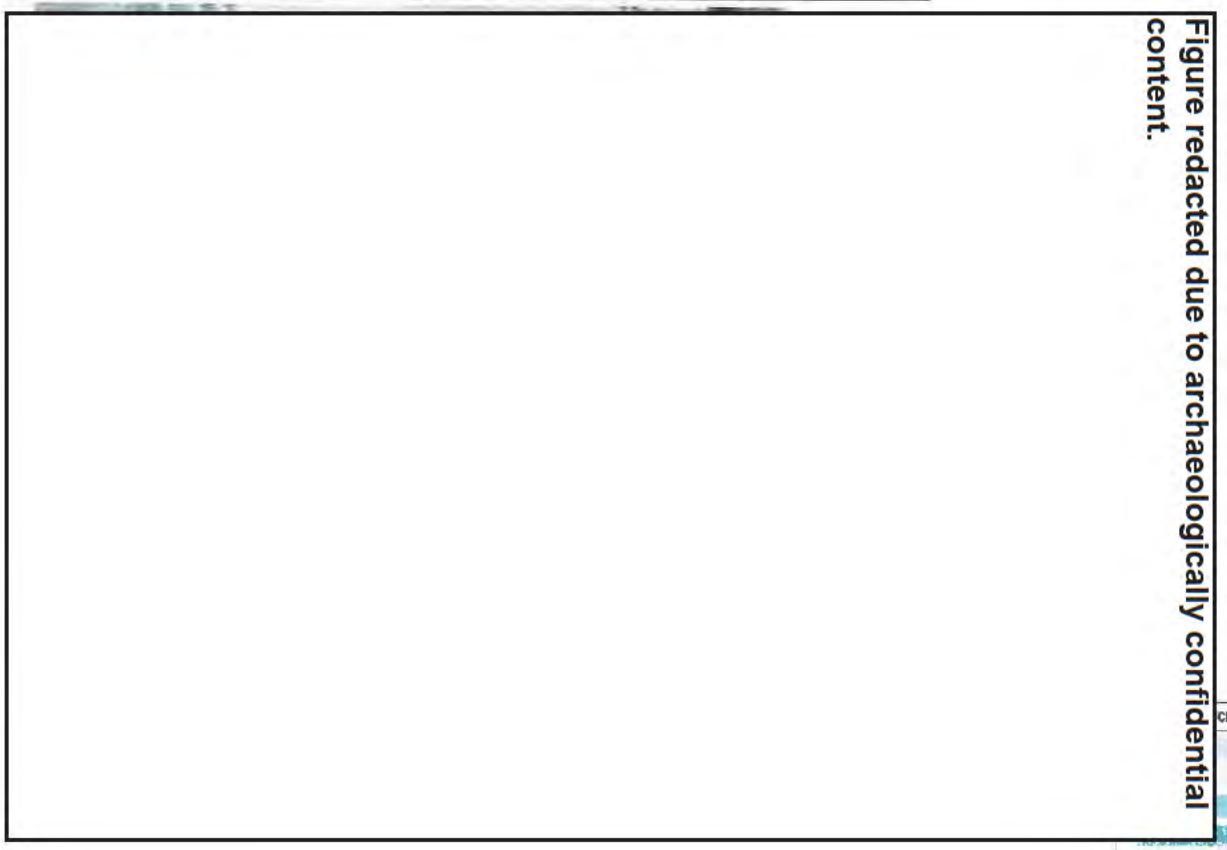


Figure redacted due to archaeologically confidential content.

CH LEGEND

AREA OF POTENTIAL EFFECTS (APE) MAP

PROJECT NAME:
OLD ARCATA ROAD IMPROVEMENTS

FEDERAL PROJECT NUMBER:

9/15/2020

9/15/20

9/15/2020

MR #

CONFIDENTIAL

CITY OF ARCATA
OLD ARCATA ROAD IMPROVEMENTS
AREA OF POTENTIAL EFFECT
P-12-000365

FIGURE 10

Figure redacted due to archaeologically confidential content.

ESA Type	APN
Type 1	50017106
	50017110
	50017206
	50018101
	50018102
	50018103
	50018104
	50018105
	50018109
	50018110
	50018111
	50018112
	50018113
	50018114
	50018115
	50018121
	50018122
	50018123
	50018124
	50018125
	50018126
	50018127
	50019121
	50019122
	50022120
	50022121
	50022127
	50022131
	50022132
	50022135
	50022136
	50101106
	50101107
	50101115
	50101116
	50101125
	50101126
	50101127
	50101128
	50101202
	50101205
	50101206
	50101208
	50101212
	50103116
	50103119
	50103120
	50103123
	50103124
	50103129
	50103131
	50103137
	50103138
	50103141
	50103142
	50104204
	50104205

DZC

Old Arcata Road Improvement Project
Cultural Resources Existing Conditions
Redwood Community Action Agency
DZC PN# 2016-09

Arcata South
USGS 7.5 Minute Map
T.5 N., R.1 E.; Sec.33.
T.6 N., R.1 E., Sec.4

1:10,000
0 500 1,000
Feet

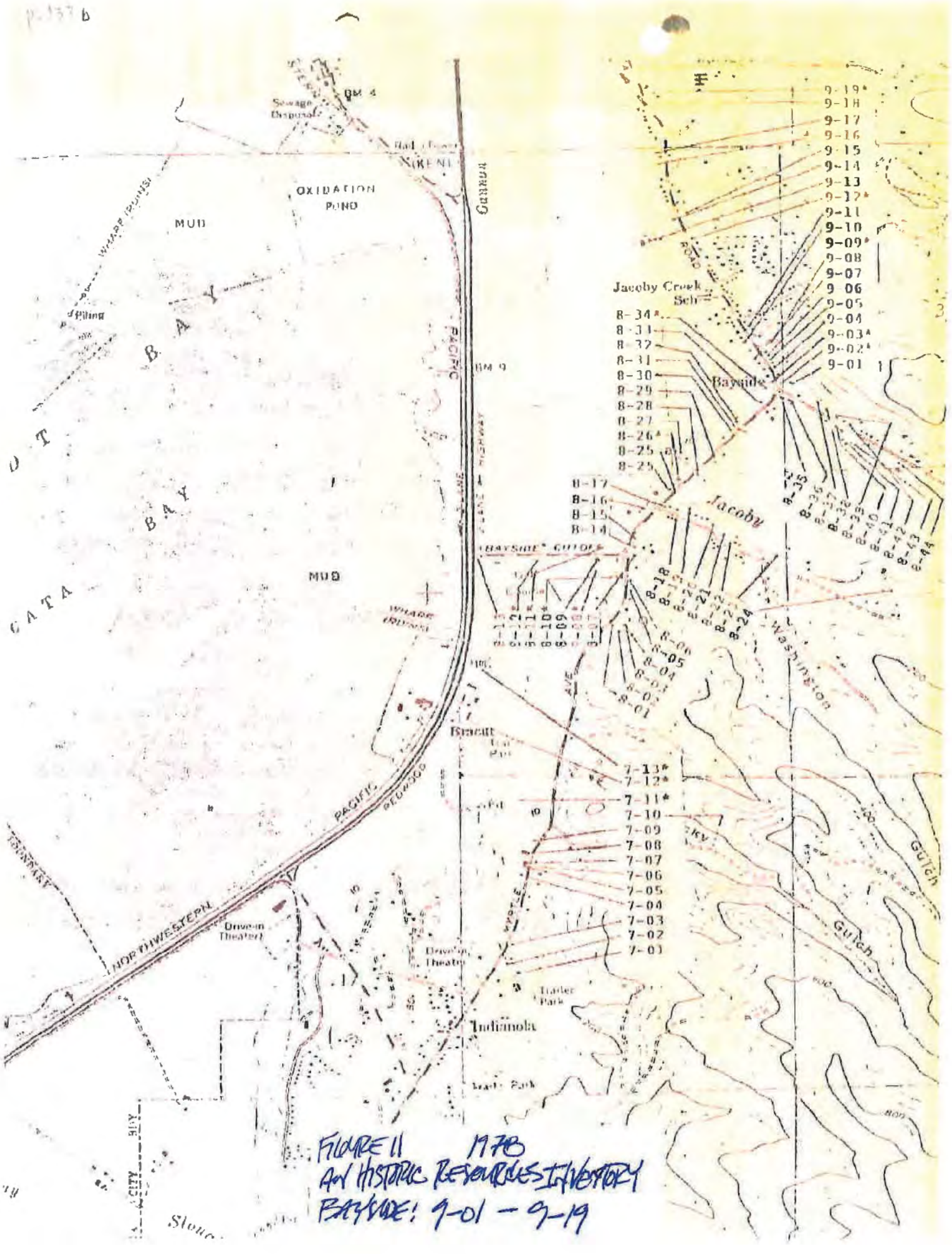


FIGURE 11 1978
AHP HISTORIC RESOURCES INVENTORY
BAYSIDE: 9-01 – 9-19

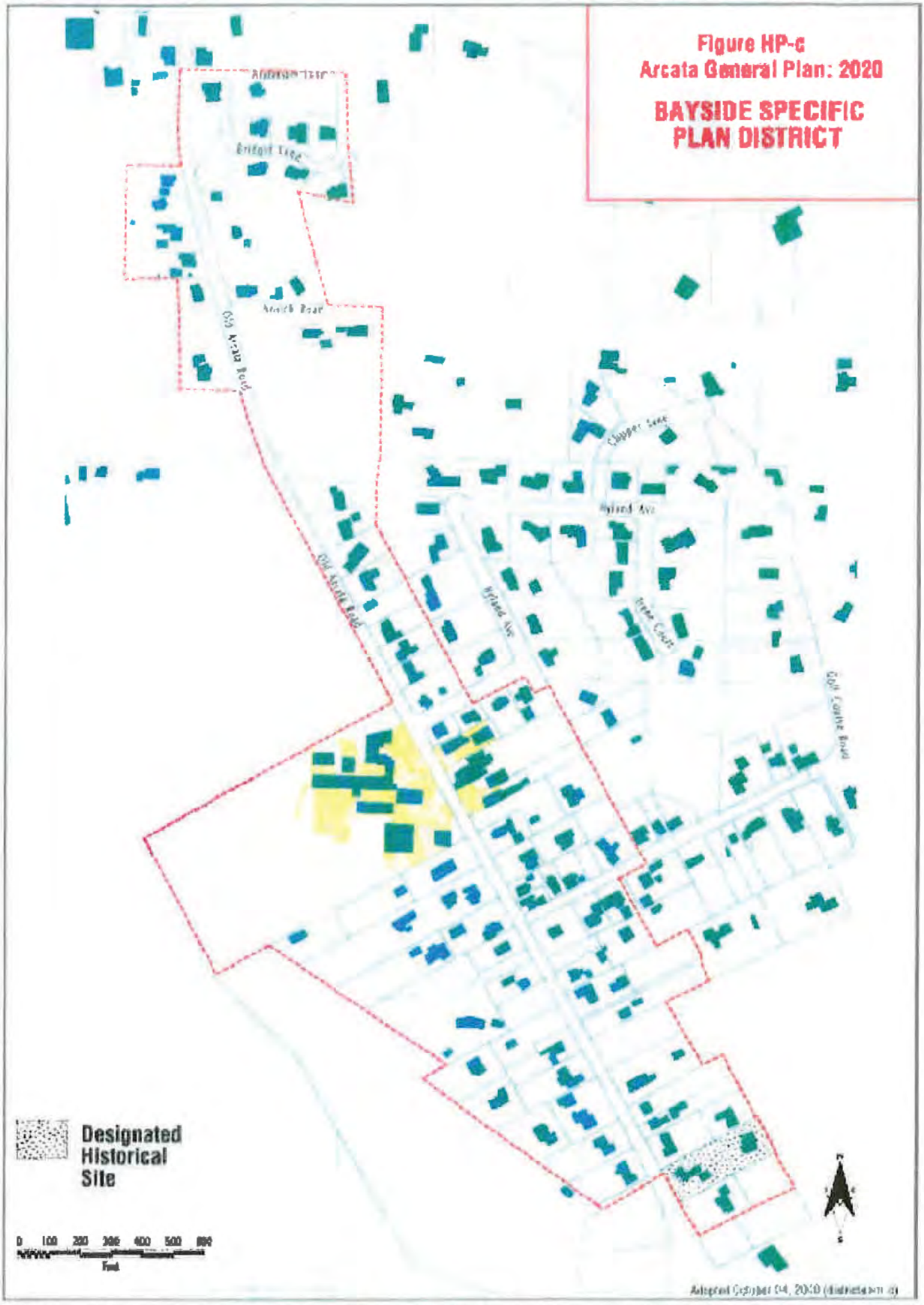


Figure HP-c
Arcata General Plan: 2020
BAYSIDE SPECIFIC PLAN DISTRICT
Designated Historical Site
0 100 200 300 400 500 800
Feet

FIGURE 12

STATE OF CALIFORNIA—THE RESOURCES AGENCY EDMUND G. BROWN JR., Governor

DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 2390
SACRAMENTO 95811
(916) 445-8006

November 3, 1978

Mr. Omar L. Homme
Federal Highway Administration
P.O. Box 1915
Sacramento, CA 95809

Attention: Bob Cady

Dear Mr. Homme:

I have received your letter of October 6, 1978 regarding the proposed highway improvement project along Myrtle Avenue - Old Arcata Road between the Cities of Eureka and Arcata in Humboldt County.

Representatives from the Federal Highway Administration, Humboldt County, and the Office of Historic Preservation conducted an on-site inspection of the project area on October 18, 1978. The area of potential environmental impact has been redefined to include the roadway corridor and adjacent properties.

I have reviewed the Historic Resources Inventory prepared by Humboldt County Department of Public Works and recommend that the following structures are eligible for inclusion on the National Register as architecturally important properties representing distinctive characteristics of a type, period, or method of construction:

3-04	Long-Graham Dairy Barn
5-05	Long-Graham House
5-06	Graham-Anderson House
5-07	George Graham House
5-10	Stephen Wilson House
5-11	Second Clifton Wilson House
5-12	Clifton Wilson Watertower
5-13	Kirkham-Chandler-Spaght House
5-14	Joseph Spinney House
6-02	Gideon Spinney House
6-03	John Pinkerton House
7-02	Viale House
7-03	Al & Mary Johnson House
7-06	George Pinkerton-McAlister Barn
7-08	George Pinkerton-Montgomery-Williamson Barn

7-09	George Pinkerton-Montgomery-Williamson House
8-05	Francis Henry House
8-06	James Henry House
8-07	Berry House
8-14	Noble House
8-16	Clendenin House
8-17	Dolbeer & Carson School/Matheson House
8-25	Campbell-Smith-Monroe House
8-28	McGuire Barn
8-30	McAdam-Barwise-Will McFarland House-Second Bayside Post Office
8-31	George Mitchell House
8-32	Bayside Presbyterian Church
8-33	Connors-Lawlor-Wilson House
9-04	Charles Monahan-Dexter House-Fifth & present Bayside Post Office
9-05	J. Venning Nellist-William Zucar-Amy Smith House
9-11	David Oscar-Nellist House
9-14	Rhodes-Marsh-Trinidad Watertower

Please feel free to contact Eugene Itogawa of my staff if you need any further assistance by calling (916) 322-8701.

Sincerely yours,

Knox Mellon

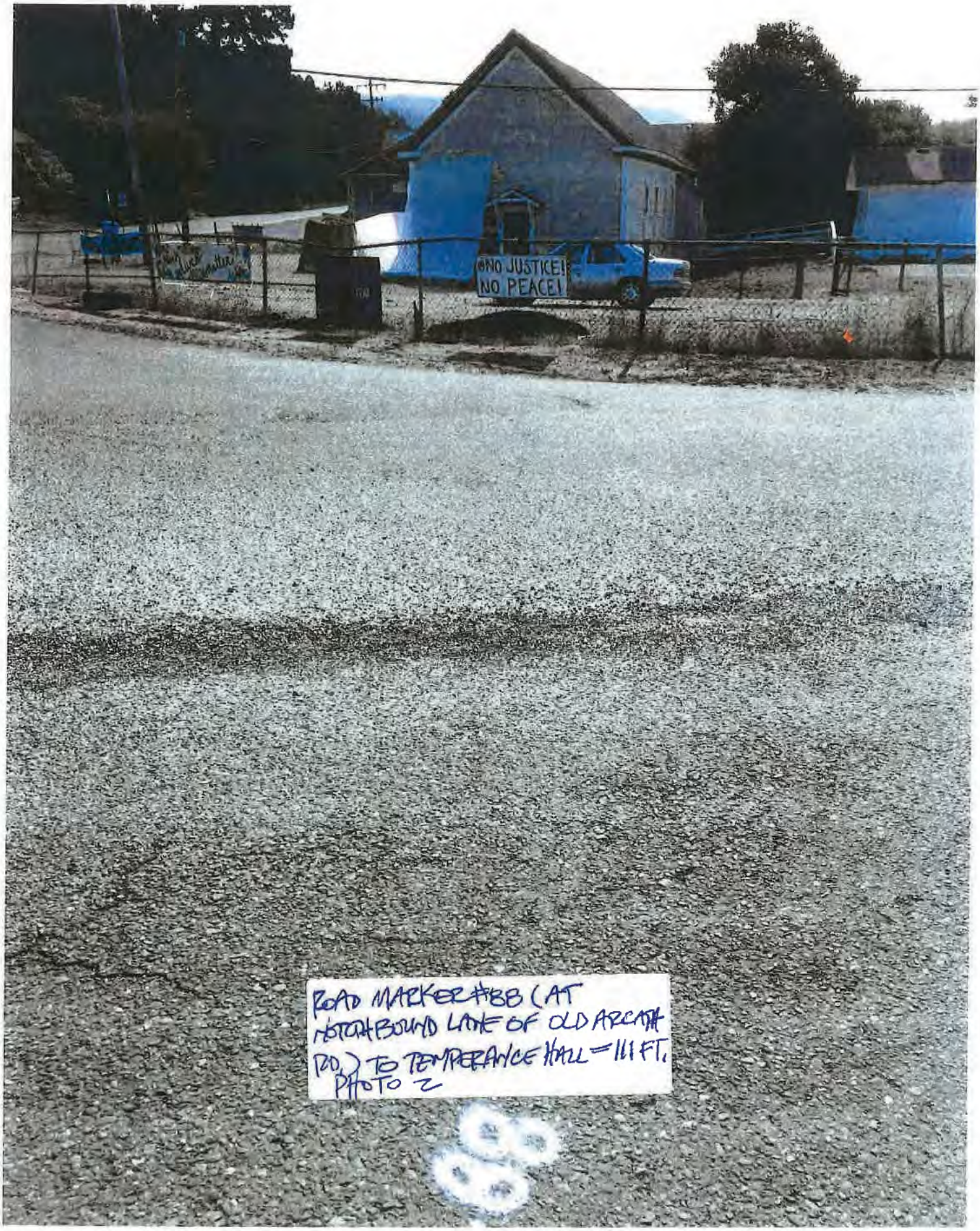
Dr. Knox Mellon
State Historic Preservation Officer
Office of Historic Preservation

GI:pbp

cc: Donald Tuttle
Natural Resources Analyst
County of Humboldt
[redacted]

Louis S. Wall
Advisory Council on Historic Preservation
[redacted]

SHUSTER 1947 AERIAL
BAYSIDE CORNERS
PHOTO 1



ROAD MARKER #88 (AT NORTHBOUND LANE OF OLD ARCADIA RD.) TO TEMPERANCE HALL = 111 FT.
PHOTO 2

CARS IN ROUNDABOUT
ROAD WAY 45'
(PHOTO 4)
FROM TEMPERANCE HALL,
OLD GRANGE IN BACKGROUND


SAVE OUR COMMUNITY HAL
CA STATE GRANGE
SaveOurHills.com
COUNTY LAND USED FOR COMMUNITY PARKING NEEDED FOR ROUNDABOUT. CITY REQUIRES ENCROACHMENT PERMIT FROM COUNTY. PHOTO 3


CARS IN ROUNDABOUT ROADWAY
45' FROM TEMPERANCE HALL
1903 OLD SCHOOL IN BACKGROUND
PHOTO 5

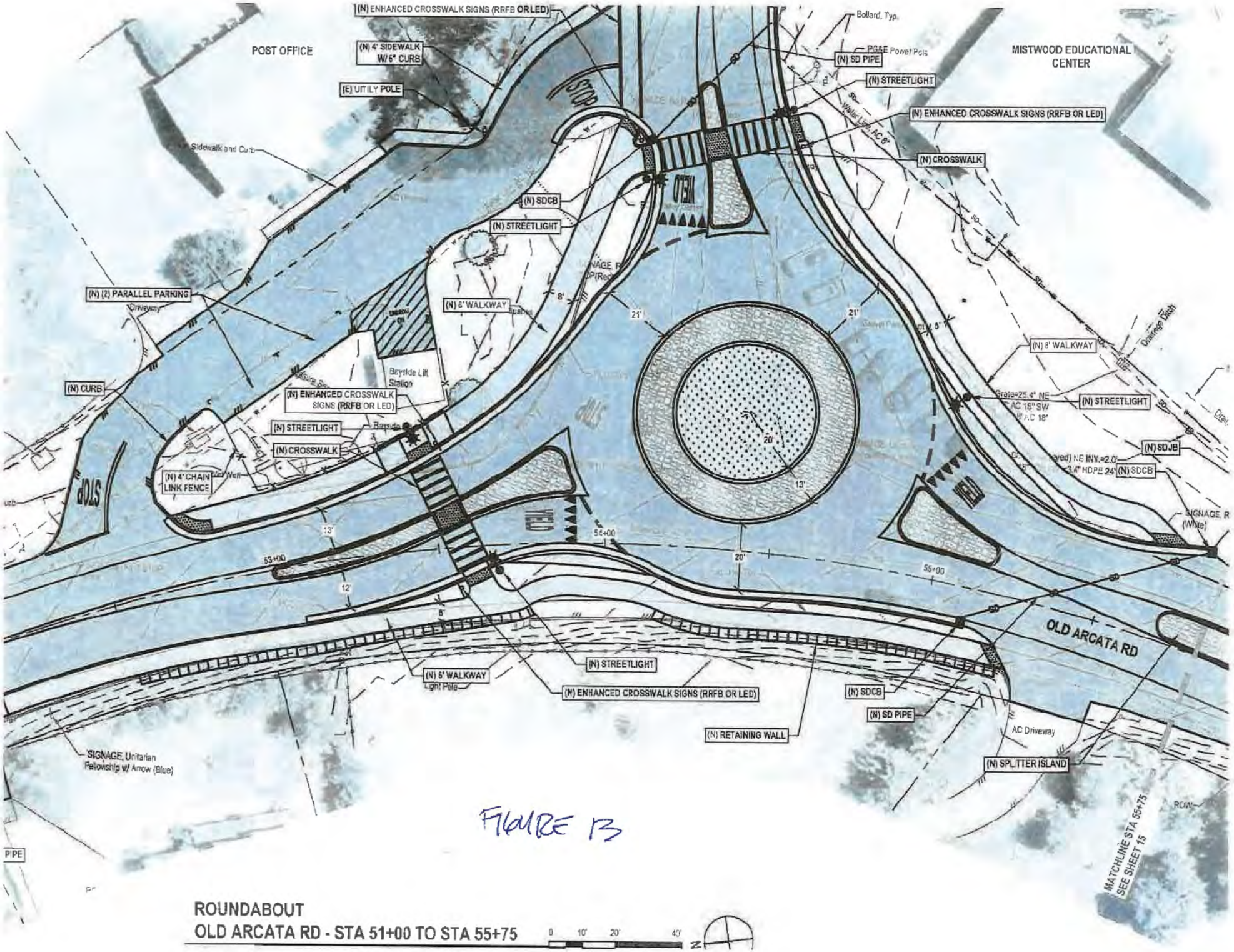


FIGURE 13

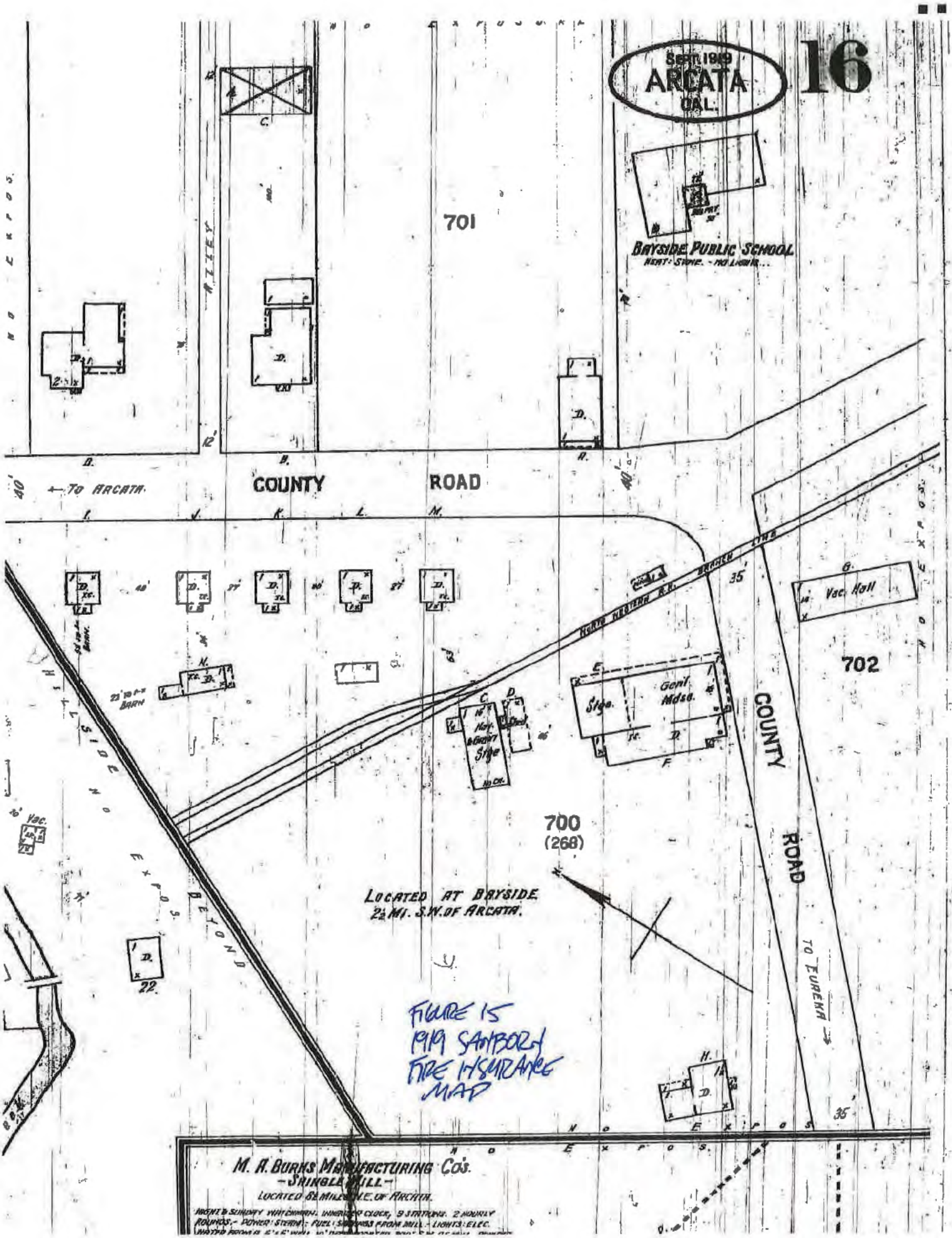
ROUNDABOUT
OLD ARCATA RD - STA 51+00 TO STA 55+75

0 10' 20' 40'

Figure 1: Rendering of Existing Intersection of Old Arcata Road and Jacoby Creek Road. Mistwood Education Center is on the right side of this image. No other known or potential historical resources are depicted.

Figure 2: Rendering of the Proposed Roundabout at the Intersection of Old Arcata Road and Jacoby Creek Road

FIGURE 14


Sept. 1919
ARCATA
CAL.
16
701
BAYSIDE PUBLIC SCHOOL
HEAT: STOVE. - NO LIGHTS.
TO ARCATA
COUNTY ROAD
NORTH WESTERN R.R.
Vac. Hall
702
Gen'l Mdse.
Stge.
COUNTY ROAD
TO EUREKA
700
(268)
LOCATED AT BAYSIDE
2½ MI. S.W. OF ARCATA.
HILLSIDE
BEYOND
Vac.
22
FIGURE 15
1919 SANBORN
FIRE INSURANCE
MAP
M. A. BURKS MANUFACTURING CO.
-SHINGLE MILL-
LOCATED 6½ MILES N.E. OF ARCATA.

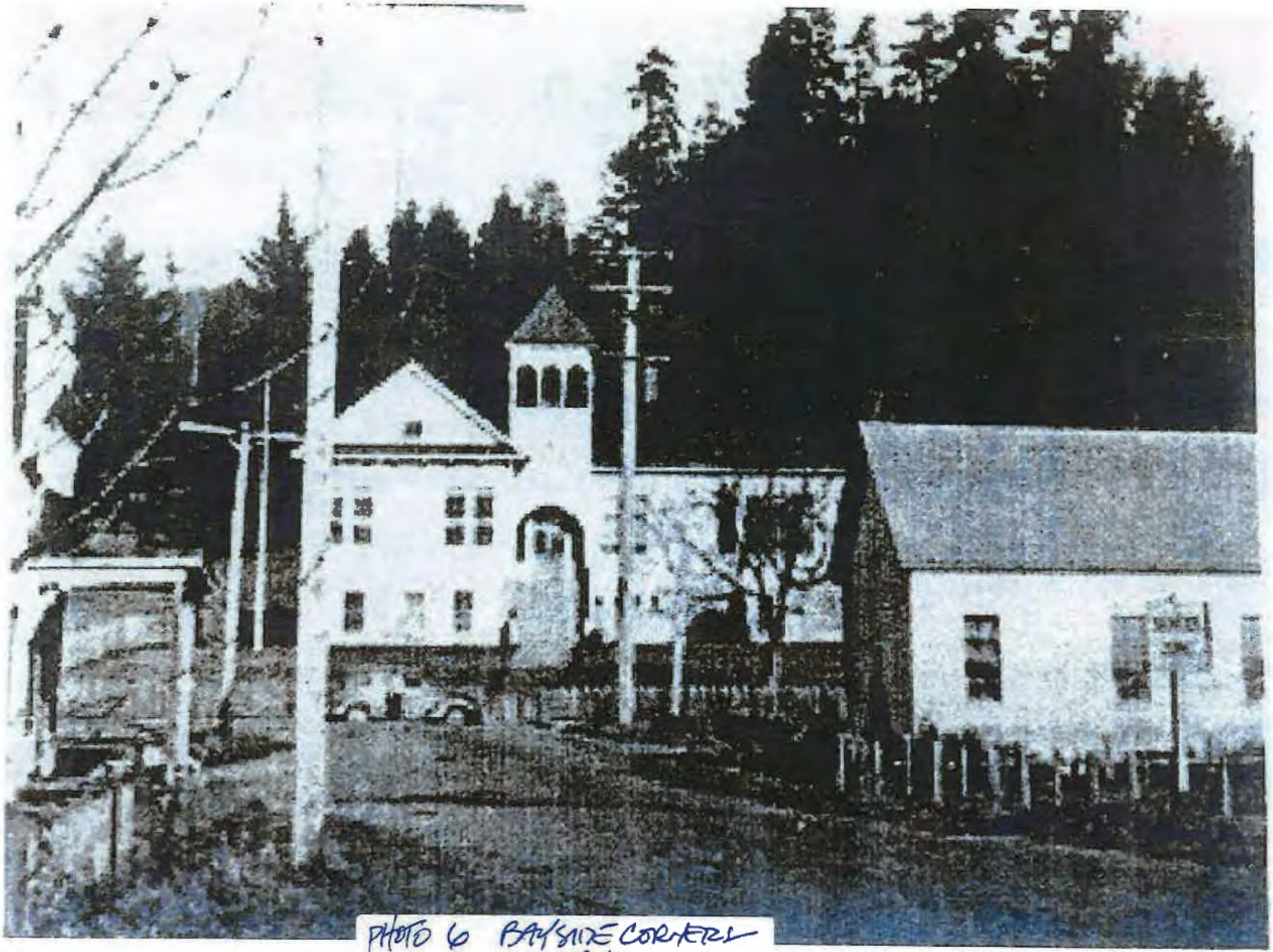


PHOTO 6 BAYSIDE CORNERS
C. 1940
LTOR: OLD STORE
OLD SCHOOL
TEMPERANCE HALL

PHOTO 7 BAYSIDE CORNERS
GOOGLE EARTH AERIAL PHOTO

PHOTO. 1887 BAYSIDE STORE
DEMOLISHED 1917 BY COUNTY
FOR ROAD PROJECT.

PHOTO 9 BAYSIDE STORE
WILSON FAMILY, OWNERS

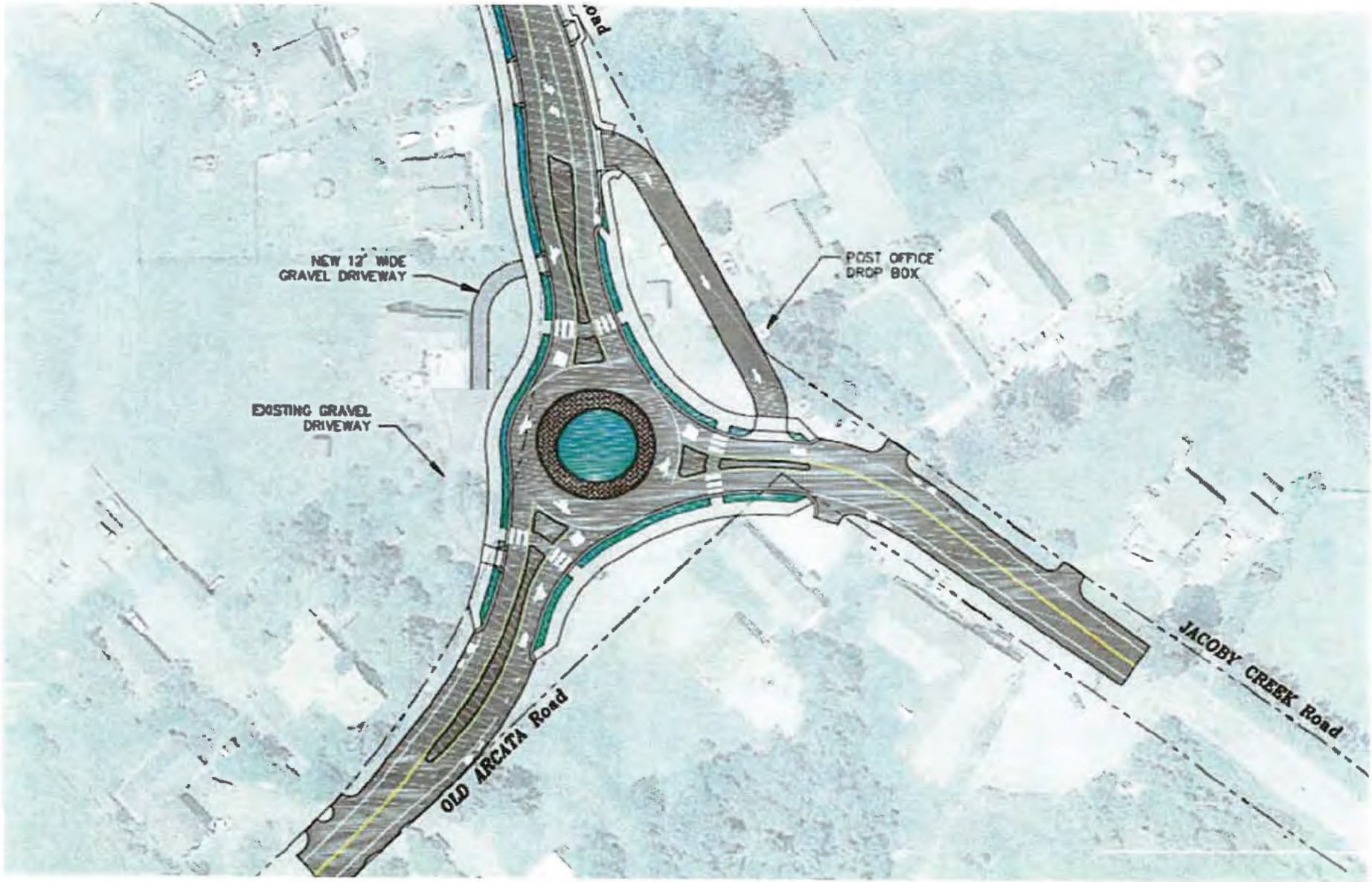


FIGURE 16
PROPOSED ROUNDABOUT AT
HISTORIC BAYSIDE CORNERS

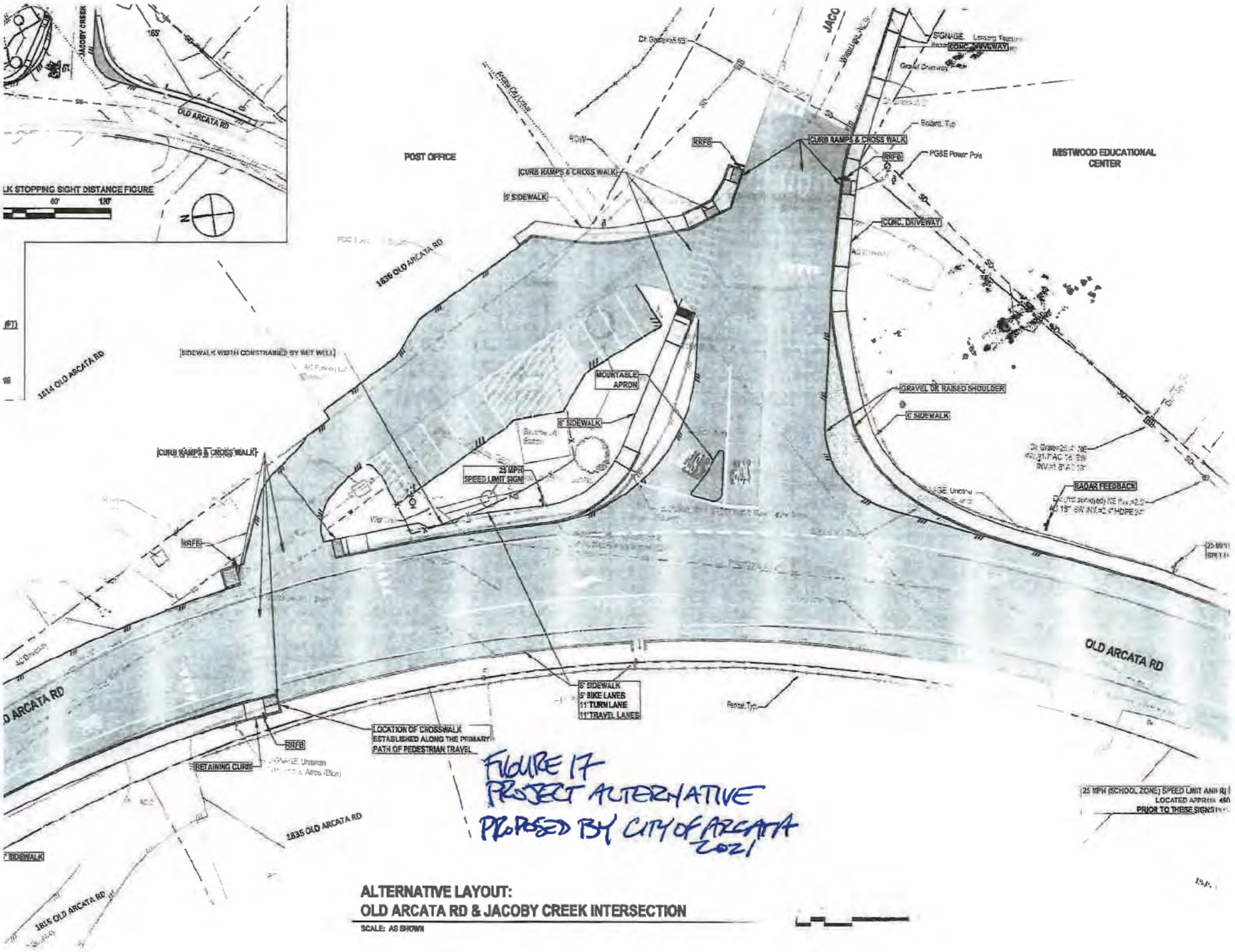


FIGURE 17
PROJECT ALTERNATIVE
PROPOSED BY CITY OF ARCATA
2021

ALTERNATIVE LAYOUT:
OLD ARCATA RD & JACOBY CREEK INTERSECTION

SCALE: AS SHOWN

Kathleen J. Stanton, M.A.

Curriculum Vitae

P.O. Box 542
Bayside, CA 95524
[redacted]

Summary

Worked professionally as a Historic Resources Consultant for over forty years, primarily in Humboldt County, but also in Sonoma and Mendocino Counties. Worked for over twenty years as a Real Estate Appraiser and seven years as a realtor in Humboldt County.

Education

Master of Arts in History, 1986
Sonoma State University, Rohnert Park, California

Bachelor Of Arts in Environmental Studies and Planning, 1980
Sonoma State University, Rohnert Park, California
Major: Urban Studies and Conservation
Minor: Historic Preservation

Licenses

Real Estate Appraiser License #AR 034999
Certified Residential
Bureau of Real Estate Appraisers, Sacramento, CA

Real Estate Salesperson License #01882689
Bureau of Real Estate, Sacramento, CA
Premier Realty and Associates, San Diego, CA

Professional Experience

Worked as an employee, contractor or subcontractor on historic projects for Eureka Heritage Society, Clark Memorial Museum, Humboldt County Historical Society, Humboldt Area Foundation, City of Eureka, City of Arcata, City of Ferndale, City of Willits, Humboldt County, Sonoma County, California Park Service, U.S. Forest Service, Redwood National Park & the Bureau of Land Management.

History Instructor, College of the Redwoods, 1998

Historic Resources Consultant, 1980 to present.
Successfully nominated: Old Town Eureka Historic District in 1991; Main Street Ferndale Historic District in 1993; Willits Carnegie Library in 1992, "Orange Lawn", Sonoma in 2008 and the Sweasey Theater/Arkley Center for The Performing Arts, Eureka to the National Register of Historic Places. Benbow Inn, Humboldt County, Point of Historical Interest, 1991. Nine

Landmark designations for the City of Arcata, 1988 -2001. Thirty-four Historic Resources Surveys & Studies, 1979 - 2006. Local Legacies Oral History Project 1998 - 2002, collaboration with six local high schools and the Library of Congress. Worked on numerous historic and prehistoric archaeological excavations in Sonoma, San Jose, Sacramento, Fort Humboldt, Eldorado National Forest, Tahoe National Forest & Mendocino County 1980 - 1987.

Awards

1995 - Preservationist of the Year, Eureka Heritage Society
2005 - Preservation Advocate, Historic Sites Society, Arcata
2007 - Educator of the Year, Historic Sites Society, Arcata

Grants

$52,000 Historic Preservation Fund Grant, Office of Historic Preservation, 1989
$2000 Preservation Services Fund Grant, National Trust for Historic Preservation, 1991
$1750 Historic Preservation Fund Grant, Office of Historic Preservation, 1991
$7000 McLean Foundation & Humboldt Area Foundation Grants, 2000

Papers

Historical Overview of the Hoopa Indian Reservation. 1986 thesis, History Dept., SSU
King Range Cultural Resource Management Plan. 1983. Bureau of Land Management
An Architectural Study of the Fur Barn at Fort Ross. 1981. CA Dept. of Parks & Recreation

Community Service

Chairperson, Historic Landmarks Committee, City of Arcata, 2010 - 2012
Secretary & Membership Manager, Humboldt County Historical Society, 1987
Special Projects Docent, Clarke Memorial Museum, Eureka, 1986 - 1990
Board Member, Eureka Heritage Society, 1988 - 1991

Professional Affiliations

National Trust for Historic Preservation
Eureka Heritage Society
Humboldt County Historical Society
North Coast Appraisers Association
Humboldt Association of Realtors

References

Susan McPherson, [redacted]
Lisa Brown, [redacted]
Carla Fuller, Fuller Appraisals, [redacted]

Letter 14 – Response to Comments

Comments from Comment Letter 14 were submitted by a Historic Resources Consultant. Please see Master Response 9 regarding Standards for Adequacy of an EIR and Disagreement Among Experts. Based on the comments received in Letter 14, as well as other comments submitted by the same commenter in Comment Letter 12 and Comment Letter 13 DEIR, the commenter, who is a historic resources consultant, disagrees with the City's findings specific to historical resources, prepared by JRP Historical Resources Consulting, LLC. In responding to comments raised in Comment Letters 12, 13, and 14 pertaining to historical resources, the City has fully disclosed the complete analysis and results assessed for the Project specific to historical resource and directly responded to specific technical points of disagreement raised in each comment submitted by the commenter. Please see also:

- Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion;
- Master Response 4 regarding noise and vibration (including potential vibratory effects on historical buildings);
- Master Response 7 regarding historical resources;
- Master Response 9 regarding standards for adequacy of an EIR, including disagreement among experts; and
- Master Response 10 regarding the architectural APE maps.

Response to Comment 14-1

APE Maps

This comment is an introductory paragraph that is a brief and broad summary of the comments that follow. These comments are addressed in responses 14-1 through 14-35.

An historic resources evaluation map is provided in the FEIR in Appendix B. Please note, property information including Assessor Parcel Numbers and street addresses were used throughout the cultural resources chapter of the DEIR. Such information provides adequate data regarding the location of known and potential historical resources that could be affected by the Project. See also Response to Comment 46-20 and Master Response 10 regarding the architectural APE maps. Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts.

Response to Comment 14-2

Inappropriately drawn APE

The comment asserts the APE was inappropriately drawn such that potential effects to historical resources were not fully analyzed. Justification for the APE is in Section 3.4 (Cultural Resources), page 3.4-11 and 3.4-18. The APE includes or excludes parcels based on different Project elements in different areas, specifically the roundabout versus minor roadway improvements elsewhere. The APE was developed in partnership with Caltrans for their purposes. The City also analyzed known potentially historic and/or landmarked properties along the project corridor outside of the APE in the DEIR.

The 2017 SHN report cited by the commenter is actually not authored by SHN, but by DZC Archaeology & Cultural Resource Management. The APE map in the DZC report is not relevant to the current Project, as it was produced for different purposes. The DZC report "was prepared to provide a current conditions assessment of known cultural resources and recommendations to assist in Project planning. Firm recommendations or mitigation measures cannot be identified until final Project activities are delineated."

(DZC 2018, Section 7) Thus, this 2017 map is not drawn in response to specific Project activities at various locations along the project route.

The DZC indirect effects APE was an arbitrary 500-foot corridor from the right-of-way centerline. It was based on a project description which was only generally defined at the time and lacked details. It was drawn to encompass various possible construction scenarios being considered, encompassing potential resources based on known potential project alternatives at the time. The DZC report, including the APE map, was prepared solely from archival research and a Northwest Information Center records search; no field survey was performed by DZC.

The DZC report includes an initial assessment of potential impacts: "The range of proposed designs appear to be consistent with the currently installed streetscape improvements and does not initially appear to have the potential to create a new effect with regard to the historic landscape, would not significantly alter existing views in the area, and would not diminish the significance of historic properties within the IE-APE." This early assessment of the project generally supports the justification for the Project APE as established in the DEIR and contradicts the assertions by the commenter.

The HRER was consistent with, and built upon, the earlier DZC analysis, finding that the Project would not result in direct or indirect impacts to any potentially undesignated historical resources along the Project corridor, even if outside the APE. Therefore, any potentially undesignated historical resources along the Project corridor were omitted from the APE, given no direct or indirect impact would result, as the APE is specifically developed to identify historic and potentially historic resources that may be directly or indirectly impacted by the Project.

Please see Master Response 7 regarding Historic Resources and Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-3

Evidence of no adverse impacts to historical resources

The comment is questioning the APE applied to the Project for historical resources and asks a number of specific questions. The City has provided responses to those specific questions in this response.

Discussion regarding establishment of the APE can be found in Section 3.4 (Cultural Resources), pages 3.4-11 and 3.4-18 of the DEIR. Vibration analysis is in Section 3.10 of the DEIR. Please also see Master Response 7, which further discusses the historical resources and the APE.

It is common practice to establish the APE based on information regarding project activities in specific locations regardless of the historic status of built environment resources in or near a project area. A survey of known and potential historical resource is then conducted. The APE encompasses the area of direct and indirect, as well as takes into account potential cumulative impacts. As noted on DEIR pages 3.4-14 to 3.4-20, analysis regarding project impacts took into account properties both within and outside of the APE, the latter to account for resources that are within the Bayside Specific Plan District. All project activities are within the existing public right of way, thus no private parcels will incur physical effects (including demolition, destruction, or alteration). Physical effects are limited to the area of project activities.

The pedestrian survey conducted by JRP was part of the process for evaluation of historical resources and for the assessment of a potential historic district. The pedestrian survey did not indicate inadequacies in the architectural APE boundary.

Vibration analysis results showed that the Project would not create vibrations that could damage buildings. Furthermore, none of the historical buildings are constructed of sensitive materials such as unreinforced masonry or adobe. Please also see Master Response 4 regarding noise and vibration.

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. Please see Master Response 7 regarding Historic Resources and Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-4

APE gerrymandering

The comment asserts gerrymandering the APE to avoid an effect. Please see also responses to Comment 14-2 and Comment 14-3, which are also related to the APE. Justification for the APE can be found in Section 3.4 (Cultural Resources), pages 3.4-11 and 3.4-18. The APE includes or excludes parcels based on different Project activities in different locations. Any potentially undesignated historical resources along the Project corridor were omitted from the APE, given no direct or indirect impact would result, as the APE is specifically developed to identify historic and potentially historic resources that may be directly or indirectly impacted by the Project. The parcels near the roundabout were included, while others elsewhere were excluded, because of the intersection's reconfiguration and addition of a new type of feature that could cause a potential visual impact. Project activities in other parts of the Project corridor such as restriping and resurfacing, construction of a new sidewalk, bike lane, etc., are minor, small scale, and not notably dissimilar in use or appearance from existing conditions, thus there was no potential for a visual effect in these areas. Therefore, no other parcels were brought into the APE. Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-5

Conflicts with the Project Area vs APE boundary

The comment regards conflicts between the Project Area and APE boundary and may be referring to sliver portions of some parcels that are within the APE. The "properties" refer to built environment resources such as buildings and structures on those parcels. The sliver portions of these parcels in the APE do not contain any historic-era built environment resources or significant landscape features that could contribute to a historical resource. Given the lack of clarify in the comment, no further response can be provided.

Response to Comment 14-6

Omission of parcels outside the County right of way

The commenter is concerned that parcels outside the County right of way (near the roundabout) were not included in the pedestrian survey of the APE. The commenter selectively picks portions of sentences and ignores the rest of the paragraph which clearly states that fieldwork was conducted throughout the Project corridor including within the Arcata city limits.

See Section 3.4 (Cultural Resources), page 3.4-11: "*Fieldwork entailed examining and taking photographs of the resources in and immediately adjacent to the APE, and noting their materials, design, and alterations. Mr. McMorris also made general observations and took photographs of the properties along the entire*

Project corridor along Old Arcata Road and Jacoby Creek Road to document the general character and periods of construction of the built environment resources in the area. Broader observations were also made of the land use, surroundings, and setting." There is one typographical error in paragraph 3, Page 3.4-11: "Parcels outside the County right of way…" should read, "Parcels outside the County/City right of way…" This error has been updated in the Final EIR Section 4 errata. Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. Additionally, the City has directed the commenter to the relevant text in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-7

Violation of 36CFR800.26(d) and 36CFR800.5 and incomplete analysis under CEQA

The commenter suggests that the APE violates 36CFR800.26(d) and 36CFR800.5 and results in an incomplete analysis under CEQA. Justification for the APE is provided on DEIR pages 3.4-11 and 3.4-18. The APE methodology described on these pages clearly conforms with 36CFR800.16(d): *"Area of potential effects means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking."* As discussed in Master Response 7 regarding historical resources, the APE was an artifact of the broader historic resources analysis; analysis within the DEIR was not limited to the APE (e.g., see Known and Potential Properties Outside of the APE starting on page 3.4-12 of the DEIR). The comment also cites 36CFR800.5, which concerns assessment of adverse effects. The adverse effects analysis is presented in Section 3.4 (Cultural Resources), pages 3.4-14 through 3.4-20. Please note, while data and analysis regarding historical resource meet the standards of both 36CFR800.16(d) and 36CFR800.5, the thresholds for evaluation and analysis for the EIR are under CEQA Guidelines Section 15064.5. The standards set forth in 36 CFR 800 are the regulations for compliance with Section 106 of the National Historic Preservation Act. Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-8

Conflicting information about survey limits in the EIR

Please see Response to Comment 14-6.

Response to Comment 14-9

Contradictory and broad reporting

The comment questions the methods, and documentation thereof, to describe the pedestrian survey of historical resources within the established APE. The APE is described in Section 3.4 (Cultural Resources), page 3.4-11. The extent of the Project is described in the Project Description on page DEIR page 2-1 and shown on maps Figures 2-1 through 2-5 of the DEIR. Thus, with a known Project Area, it is not necessary to list every address or parcel number along the Project corridor. The description of fieldwork on page 3.4-11 states that a pedestrian survey was conducted along the entirety of the Project corridor. Addresses are given for the three significant historical resources identified in the APE (DEIR page 3.4-12). Addresses and APNs are also given for the four other "known or potential" historical resources outside of the APE, but along the Project corridor (DEIR page 3.4-13). The general and broad observations made during fieldwork

noted in the methodology section on page 3.4-11 were used in the effects analysis section of the DEIR, pages 3.4-15 through 3.4-20. To further clarify, parcels within the architectural APE containing properties less than 45 years of age were determined not to be historically significant. Please see Final EIR Section 4 – Errata, which lists the addresses and APNs of the three parcels in addition to those determined to be historically significant. This section also describes the historical resources evaluation in brief, the method used to develop the APE, and the purpose of the APE.

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-10

Lack of reference to the architectural APE within the EIR

The comment regards the architectural APE. The comment also inaccurately states the EIR does not include the term “architectural APE.” The City directs the commenter to Section 3.4.1 on page 3.4-1 on the EIR, which states the Study Area is also referred to as the APE. See also Section 3.4.5 for Methods used during the Historical Resources Evaluation, starting on page 3.4-11 of the DEIR, which also refer to the APE. Please also see Master Response 10 regarding the architectural APE maps. Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-11

Historical survey was insufficient

The commenter finds the completed historical survey insufficient. The description of fieldwork in Section 3.4 (Cultural Resources), page 3.4-11 states that a pedestrian survey was conducted along the *entirety* of the Project corridor. As stated in the DEIR, this included observations of the setting, as well as the buildings and structures. The entire Project corridor was surveyed and the three historic-era properties were surveyed at a more intensive level because they were in the APE and being recorded and evaluated for National Register and California Register eligibility. This level of survey includes taking multiple photographs from a variety of angles and taking extensive notes on each building’s architectural details. Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-12

Erroneous EIR analysis

The commenter disagrees with the analysis in the DEIR. The DEIR does say, “…the six parcels outside the County right of way that are in the APE…,” (p. 3.4-11), which is not precise. As stated in Master Response 7 regarding historical resources, there are six parcels in the APE adjacent to the roundabout. Three of those parcels are within City limits; the other three parcels are within County jurisdiction. All six parcels are outside the public right of way (City and/or County). However, the three parcels historic-era parcels in the APE (MR 1, MR 2, and MR 3) are all outside of City boundaries, and thus are outside and adjacent to the County right of way.

The second part of this comment is again about survey area and maps not being included in the DEIR. The survey methodology and location are clearly discussed on DEIR page 3.4-11. An APE map is provided in the FEIR. Addresses and Assessor Parcel Numbers were included in the DEIR that provided adequate data regarding the location of subject properties. As indicated, the three other non-historic era properties were not evaluated because they do not contain built environment resources 45 years old or older. Page 3.4-11, states that "…*JRP identified three historic-era (45-years old or older) built environment resources*…." Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-13 and Comment 14-14

Omission of two architectural properties from analysis

The commenter notes two architectural properties were omitted from analysis in the DEIR. No part of the parcels at 1666 Old Arcata Road and 1972 Old Arcata Road are located within the APE. These properties are also not among the four known or potential historic properties outside the APE as described in Section 3.4 (Cultural Resources), pages 3.4-12 and 3.4-13. These two properties were specifically omitted from the APE because there is no potential for physical or visual effects to either properties. Please see Master Response 7 regarding historical resources.

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-15 and Comment 14-16

Omission of many other historical properties

The commenter asserts other historical resources were not included in the DEIR's analysis. As discussed in Master Response 7, parcels with no potential for physical or visual impact from the Project were excluded from the APE. However, other properties specifically noted as potentially historic along the project corridor were also evaluated in the DEIR. There is no rationale for including other properties in the Draft or Final EIR.

The commenter's references to SHN 2017 are actually referring to a DZC (2017) assessment, which identifies 58 "structures" built between 1945 and 1965 along the Project corridor. The DZC report does not define a period of significance or claim that any of the 58 properties are historically significant. The comment does not include the remainder of the paragraph cited, which contradicts the commenter's assertion that these properties should have been surveyed. The DZC report states that, "approximately fifty-eight additional structures dating from the Post-War era (1945-1965) are adjacent to the ROW and meet the age threshold for consideration as historic resources. These structures are as of yet unsurveyed and unevaluated. The level of effort to identify and evaluate historic resources should be commensurate with the level of risk inherent in the project. At this time, the Project proposes to conduct minimal construction activities within an established streetscape already replete with non-historic period infrastructure including paving, streetlights and utility poles and which have already altered existing views in the area. A full scale architectural survey for these structures is not recommended at this time" (DZC 2018, Section 6.6).

The properties noted in the comments were not evaluated because they are not in the APE. The DEIR does recognize the four properties identified in the 1978 report that are within the Project corridor, but outside of the APE. These four and the potential for a historic district are discussed on pages 3.4-12 and 3.4-13 and 3.4-18 – 3.4-20 of the DEIR. As discussed in Master Response 7 regarding historical resources, analysis within the DEIR was not limited to the APE (e.g., see Known and Potential Properties Outside of the APE starting on page 3.4-12 of the DEIR). The HRER and the DEIR found that the Project would not result in direct or indirect impacts to any potentially undesignated historical resources along the Project corridor, even if outside the APE. Potentially undesignated historical resources along the Project corridor were omitted from the APE because the Project had no potential to directly or indirectly impact them.

The commenter, in citing the 1978 report (Humboldt County DPW 1978), seems to be referring to the November 3, 1978 SHPO letter attached to a PDF of the 1978 report. In this letter SHPO recommends these properties are individually eligible. SHPO does not recommend the properties are eligible as an historic district, nor does the text of the 1978 report suggest a historic district or recommend an eligible historic district. Note that the SHPO letter recommends 32 properties eligible for the National Register, but only the four discussed in the DEIR are along the Project corridor.

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-17

City of Arcata General Plan violations, part 1

The commenter asserts the DEIR violates the Arcata General Plan but provides no substantial evidence. The Project does not conflict with the listed Arcata General Plan policies, as the Project will not interfere with the preservation of historic landmarks, affect historic landmark designations, impede the addition of Bayside to the City's Historical Resources Inventory, impede the designation of Bayside as a Neighborhood Conservation Area, or interfere with perseveration measures for historic properties in the Bayside Specific Plan District. As stated in the DEIR, starting on page 3.4-19:

> *There is also no historic district as per City of Arcata regulations. As noted above, the City of Arcata General Plan 2020 recommended a Bayside Neighborhood Conservation Area (NCA) and designated a Bayside Specific Plan District (SPD), but has not prepared a corresponding Bayside Specific Plan. The General Plan did not designate Bayside as a historic district, and neither an NCA nor an SPD are historic districts. Rather, these are geographic areas recognized as containing historic buildings and structures, and designation as an NCA or SPD puts certain restrictions on new construction and modifications or alterations of noteworthy buildings and structures to assure that any changes are harmonious with the existing character of these areas. Notwithstanding formal designation as an NCA or a specific plan for the Bayside SPD, the Project would not impair the historic attributes of any buildings or structures in a potential Bayside NCA or the Bayside SPD.*

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. No revisions to the EIR are required to be made.

Response to Comment 14-18

City of Arcata General Plan violations, part 2

The commenter asserts the DEIR violates the Arcata General Plan but provides no substantial evidence. Discussion of the Bayside Specific Plan District can be found in Section 3.4 (Cultural Resources), pages

3.4-13 and 3.4-18 through 3.4-20. The Project will not conflict with Bayside Specific Plan District or the Bayside Neighborhood Conservation Area. Based on substantial evidence in the record, the DEIR found that the specific plan district and the NCA do not constitute an historic district. Contrary to the claim, the neighborhood Conservation Areas and Specific Plan Districts are not the City's version of historic districts. The General Plan Design and Historical Preservation Element Policy H-4, Neighborhood Conservation Areas (NCAs) and Specific Plans, states the objective of NCAs and Specific Plan Districts is to "assure (sic) that new construction, modifications, or alterations of noteworthy structures, and significant changes to other structures are harmonious with the existing character of these neighborhoods." No policy contends that the NCAs and Specific Plan Districts are equivalent to historic districts. They do, however, require that modifications ensure that the historic resources that are within the boundaries are considered during project review in the NCAs and Districts. The DEIR evaluated the consideration of a potential historic district (see Consideration of a Potential Historic District in Section 3.4 – Cultural Resources, starting on page 3.4-19). As sated on page 3.4-19, concluding:

> *Examination of documentary evidence to determine the history of the Bayside community and the properties in the APE, combined with field survey observations, revealed there is no potential for the formal creation of an historic district in or overlapping with the APE as defined by NRHP and CRHR guidelines.*

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The No revisions to the EIR are required to be made.

Response to Comment 14-19

Humboldt County General Plan violations

The commenter asserts conflicts with the County General Plan policies CU-G1 (protection and enhancement of significant cultural resources), CU-P1 (identification and protection), and CU-P3 (consultation with other historic preservation agencies and organizations), as the Connors-Lawlor-Wilson House at 1945 Old Arcata Road was not included in the DEIR. The Connors-Lawlor-Wilson House at 1945 Old Arcata Road is south of the proposed roundabout and the parcel is entirely outside of the APE. Please see Master Response 7, which discusses the APE. As discussed in Master Response 7 regarding historical resources, the APE was an artifact of the broader historic resources analysis; analysis within the DEIR was not limited to the APE (e.g., see Known and Potential Properties Outside of the APE starting on page 3.4-12 of the DEIR). Thus, the Connors-Lawlor-Wilson House at 1945 was omitted from the APE because early analysis determined the building would have no potential for impact related to the Project.

Public outreach for this Project was undertaken by the City of Arcata and consisted of public meetings held in Bayside at the Bayside Grange on August 16, 2019, and at the Old Jacoby Creek School on October 23, 2019. Please see Master Response 6 regarding the community engagement process. Please also see Maser Response 7 regarding historical resources and includes a discussion about the Project's potential direct and indirect impacts to historical resources.

In addition to the outreach efforts by the City, JRP consulted the written work of several local historians as discussed in Section 3.4 (Cultural Resources), page 3.4-11.

Contrary to the commentor's assertion, it is not "standard practice" or legally required to seek out and speak directly with local historians, or to speak with local residents for this type of project. Humboldt County GP CU-P3 states that "Historic preservation agencies and organizations shall be consulted…" This section of the Humboldt County GP puts forth a long list of potential parties to contact, including "local historians" but

this is a list of suggestions to choose from; It does not require consultation with any particular party or local residents.

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-20

Historic context is limited, part 1

The commenter states the historic context presented in the DEIR is extremely limited. The historic context in the DEIR that ends in 1925 is a condensed version of the context from the HRER prepared for the Project. Section 3.4 of the DEIR is intended to analyze impacts to historical resources, and presentation of a comprehensive history of Bayside is not necessary for that purpose. The full historic context up to the 1980s is in the HRER that was prepared for the Project (see Section 4 of the HRER regarding the Historical Overview, starting on page 6 and continuing through page 16).

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-21 and Comment 14-22

Historic context is limited, part 2 and part 3

The commenter is concerned the DEIR does not consider social and economic transformations in Bayside following the war but provides no substantial evidence. The post-war properties referred to by the commenter are outside of the APE. A historic context does not determine the APE. A historic context provides both a general background of an area and specific information from which the reader can comprehend the relevant history of properties that are being evaluated. A historic context is not the same as a period of significance. Periods of significance are applicable only to historically significant properties, e.g., properties that are eligible for the National Register/California Register. Thus, it is not possible to have a period of significance without a historically significant property. The “Period of Significance (1860-1970)” referred to in the comment is the opinion of the commentor. The post-war period may indeed be an important era in Bayside history, but that is not relevant because no properties from that period are in the APE.

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-23

Incorrect period of significance for Temperance Hall

The commenter disagrees with the period of significance attributed to Temperance Hall but provides no substantial evidence. While the historic context in the DEIR ends in 1925, it is a condensed version of the context from the HRER prepared for the DEIR. Chapter 3.4 of the DEIR is intended to analyze impacts to

historical resources and presenting a comprehensive history of Bayside is not necessary for that purpose. A historic context is a history of the area; a historic context does not define a period of significance.

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-24

Temperance Hall architectural merit

The commenter suggests that Temperance Hall also qualified for the National Register based on its architectural merit but provides no substantial evidence. The commentor's assertion regarding the architectural merit under National Register/California Register Criterion C/3 is a difference of opinion. JRP concluded in the HRER that the building was a typical, modest, and unremarkable example of its architectural style and was not eligible under Criterion C/3. This difference of opinion is fundamentally irrelevant for the purposes of the DEIR as JRP concluded the property was eligible for the National Register/California Register under Criterion A/1, thus is a historical resource under CEQA. Eligibility under different criteria would not affect analysis regarding the Project's potential impacts to this property. The impact evaluation for Temperance Hall begins on page 3.4-16 of Section 3.4 (Cultural Resources), which concluded any potential impact to the building would be less than significant, based, in part on the following conclusion excerpted from page 3.4-17:

> *The Project, therefore, is not proposing to replace a historic intersection, but rather a modern intersection reflecting modern highway design and engineering that does not contribute to the significance of the property. Other changes in the immediate vicinity of the intersection that have occurred over time are the loss of many late nineteenth century and early twentieth century buildings and structures, and the addition of multiple newer buildings, such as the US Post Office across Jacoby Creek Road from the Temperance Hall and two residences built within the past 30 years across Old Arcata Road from the building. These alterations have changed the setting of Bayside Corners and the immediate surroundings of the Temperance Hall when the building was constructed in 1882, yet this property and Bayside Corners still maintain a rural feeling and setting, and the Project would not substantially alter the surroundings such that this property can no longer convey its significance. Any potential impact would be less than significant.*

Please see Master Response 7 regarding historical resources. Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-25

Temperance Hall setting

The commenter suggests that the setting of Temperance Hall is significant, given the building also qualified for the National Register based on its architectural merit but provides no substantial evidence. The comment inaccurately suggests a difference in the importance or application of integrity of setting between a historical resource eligible for National Register/California Register Criterion A/1 and one eligible for National Register/California Register Criterion C/3. The comment suggests that setting has more importance to the significance of a property eligible under National Register/California Register Criterion

C/3. Guidance regarding this issue states otherwise. A discussion of integrity relative to resources eligible under Criterion C in *National Park Service Bulletin 15: How to Apply the National Register Criteria for Evaluation* states, “Retention of design, workmanship, and materials will usually be more important than location, setting, feeling, and association” for properties eligible under Criterion C (National Park Service 1997: 48). In other words, the physical features and characteristics of the building carry more weight in assessing integrity. JRP’s analysis of the Project’s effects on Temperance Hall is provided in Section 3.4 (Cultural Resources), pages 3.4-16 and 3.4-17.

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-26

Temperance Hall – additional characteristics

The comment pertains to the historical characteristics of Temperance Hall. Please see Response to Comment 14-25. Also, JRP concluded that the Temperance Hall had sufficient overall integrity to be eligible for the National Register/California Register under Criterion A/1. See page 3.4-12 of Section 3.4 (Cultural Resources), which states:

> *The HRER concluded that the Temperance Hall, built in 1882, appears to meet the criteria for listing in the NRHP / CRHR under Criteria A / 1 at the local level for its significant association with community development in Bayside and is a historical resource under CEQA. The period of significance is 1882 to 1970. The property boundary is its legal assessor parcel. The property’s character-defining features are its massing; rectangular plan; front-gable roof; cornice returns; vertical posts at the building corners; modest appearance and lack of ornamentation; horizontal wood siding; front entryway; all of the original wood-sash windows, and its location at Bayside Corners. The other building on the parcel was constructed in the 1980s and is not a contributing feature of the historical resource. The parking lot on the front (west side) of the building was formed after the 1946 realignment of Old Arcata Road into its current configuration. This feature does not contribute to the significance of the property.*

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-27, Comment 14-28, Comment 14-29, and Comment 14-30

Impacts of roundabout to Temperance Hall and other properties

The commenter is concerned the roundabout will impact historical properties but provides no substantial evidence. The impacts analysis for the Temperance Hall, Old Jacoby Creek School, and Grange Hall can be found in Section 3.4 (Cultural Resources), pages 3.4-15 through 3.4-17. The “old T-intersection” is no longer intact. The area in front of the Temperance Hall is an oblong gravel parking lot; it does not resemble a road. Reconfiguration in 1946 with the construction of the sweeping curve destroyed the historic configuration of the entire intersection. The “open space” referred to in the comment is the gravel parking lot, which was created after the 1946 reconfiguration of the intersection. It is not a feature of the setting that contributes to the historic significance of the Temperance Hall. Prior to the 1946 reconfiguration of the

intersection, the historic alignment of Old Arcata Road passed within about 15 feet of the Temperance Hall front door, much closer than the proposed roundabout.

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-31

Historical significance of Temperance Hall parking area

The commenter asserts the DEIR disregards the historical significance of the parking area at Temperance Hall, located, in part, in the County right of way. The commentor does not provide any substantial evidence. As stated in Section 3.4 (Cultural Resources), pages 3.4-16 and 3.4-17, the “open space” is not a feature of the setting that contributes to the historical significance of the Temperance Hall. The current transient use of this open space does have bearing on an analysis of the Project’s impacts to the historical resource.

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-32

Parking; cumulative impacts to historical resources, part 1

The comment regards parking, as related to continued preservation of historic properties. Please see response to Comment 14-31 regarding the historical significance of the informal parking area near Temperance Hall. There is no evidence that there is a foreseeable impact in the future that can be correlated with a reduction in parking. For such an impact to occur, the proposed change in parking for users of this property would need to result in a severe modification of behavior such that operations at the former Temperance Hall would shift in dramatic ways that lead to neglect of the property such that its historic integrity of materials, workmanship, and feeling would be greatly diminished. There is no evidence to indicate that this will occur as a result of the current project. Construction of a new parking area on the parcel would likely require its own clearance under CEQA, which would result in a process that would likely result in efforts to minimize impacts to the historical resource.

The comment also regards cumulative impacts to historical resources. Economic impacts are not an environmental issue as defined in the CEQA Appendix G Environmental Checklist, and parking will continue to be available in the general vicinity. Please see Master Response 3 regarding parking. This assertion by the commentor is speculative and non-occupancy of a building does not necessarily result in loss by neglect. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion.

The cumulative effects analysis specific to historical resources can be found in Section 3.4.7 (Cumulative Impacts), starting on page 3.4-21. Methods used to complete the cumulative effects analysis can be found in Section 3.0 (Analysis Overview), starting on page 3-2.

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-33

Cumulative impacts to historical resources, part 2

This comment also raised concerns regarding cumulative impacts to historical resources. The many changes to Bayside Corners that have diminished its historic character are discussed in Section 3.4 (Cultural Resources), pages 3.4-15 through 3.4-20. Please see analysis of the Project's impacts to historic and potentially historic properties found on the same pages. Please see analysis of cumulative impacts in Section 3.4 (Cultural Resources), pages 3.4-21 and 3.4-22.

The assertion that the old T-intersection is still intact in front of the Temperance Hall is not supported by evidence. This area is an oblong parking lot. While some old asphalt may remain in front of the Temperance Hall from the pre-1946 roadway, the entire intersection was reconfigured in 1946. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion.

The cumulative effects analysis specific to historical resources can be found in Section 3.4.7 (Cumulative Impacts), starting on page 3.4-21. Methods used to complete the cumulative effects analysis can be found in Section 3.0 (Analysis Overview), starting on page 3-2.

Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-34

Changes to the setting, feeling, and association of historical resources

The comment regards impacts to historical resources as a result of changes in setting, feeling, and association associated with the proposed roundabout but does not provide any substantial evidence. The City disagrees that the roundabout, or any other Project component, would significantly impact historical resources. The historical resources analysis conducted for the DEIR did include consideration for the setting, feeling, and associated of evaluated resources. As concluded on page 3.4-20 of the DEIR:

> *In summary, the Project would not diminish the integrity of location, design, materials, workmanship, or association of any historical resource because the Project is entirely within the public right of way and would not physically alter any property. The integrity of feeling and setting would be slightly modified, but this would not result in a substantial adverse change to any known or potential historical resource under CEQA. The feeling and setting would not be altered to a significant degree because: the Project components are modest in scale, sympathetic to the surroundings, and similar to existing conditions; improvements to the intersection are alterations to the 1946 realignment, not to the original historic intersection; and the setting is already a mixture of old and new built environment. Thus, the historical resources in the APE and along the Project corridor would retain their overall integrity and retain their ability to convey their historical significance.*

Please also see analysis of the Project's impacts to historic and potentially historic properties found in Section 3.4 (Cultural Resources), pages 3.4-15 through 3.4-20. Please see analysis of cumulative impacts in Section 3.4 (Cultural Resources), pages 3.4-21 and 3.4-22.

Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the

DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-35

Adverse impacts to Bayside Corners

The comment asserts adverse impacts to the historic integrity of Bayside Corners. Please see analysis of cumulative impacts are in Section 3.4 (Cultural Resources), pages 3.4-21 and 3.4-22. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. Please also see Master Response 9, which addresses the standards of adequacy of an EIR and disagreements among experts. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 14-36

Preference for alternative design

The comment expresses preference for Alternative 2 (Modified T-Intersection). Alternatives to the Project are discussed in Section 4 of the DEIR. As included in Section 4.5 of the Alternatives Analysis (page 4-15), the environmental impacts of the Project and Alternative 2 (Modified T-Intersection) were found to be equivalent. The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

From: Netra Khatri
Sent: Friday, August 20, 2021 10:53 PM
To: David Loya; Delo Freitas; Keala Roberts
Cc: Andrea Hilton; Josh Wolf; Misha Schwarz
Subject: Fwd: Notice of Availability of Draft Environmental Impact Report (EIR): Old Arcata Road Rehabilitation Project

EIR comment

Sent from my iPad

Begin forwarded message:

From: Sean Armstrong [redacted]
Date: August 20, 2021 at 6:05:43 PM PDT
To: Netra Khatri <nkhatri@cityofarcata.org>
Cc: Marc Delany [redacted] Karen Diemer <kdiemer@cityofarcata.org>, Mark.Arsenault@dot.ca.gov, Dallas Huston [redacted] Bob Mcpherson <bob.mcpherson@humboldt.edu>, Susan Mcpherson [redacted] "Wilson, Mike" <Mike.Wilson@co.humboldt.ca.us>, "Johnson, May" <May.Johnson@sen.ca.gov>
Subject: Re: Notice of Availability of Draft Environmental Impact Report (EIR): Old Arcata Road Rehabilitation Project

Hi Netra,

This is an official Comment Letter for inclusion and written response in the DEIR. I have seperated my comments into three (3) sections:

1. When I started reading the Transportation section of the Draft EIR, I noted in the introduction to the VMT analysis on 3.11-2 that neither the County nor the City have adopted VMT "thresholds", and this is a joint County and City Project. My first comment is that there appears to need to be an Approved threshold by both the County and City in order for this EIR analysis to be sufficient. If there is no Standard against which we can compare this design, the EIR Transportation Analysis becomes potentially arbitrary. I assert that there must be an adopted VMT Threshold by the City and the County for this DEIR. I will note that VMT became law in 2013, with an end date for LOS in 2020, so there has been more than enough time for the City and County to perform VMT analysis, adopt Policies and establish EIR Analysis Thresholds. We need not let Local Government's lack of preparation become the Public's emergency. Do you disagree, and if so, why? 15-1

Vehicle Miles Traveled

SB 743 creates a process to change the way that transportation impacts are analyzed under CEQA. Specifically, SB 743 required the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines to provide an alternative Maintenance of Effort (MOE) to control delay and associated Level of Service (LOS) for evaluating transportation impacts, which was done in early 2019. OPR recommends that vehicle miles traveled (VMT) become the primary metric or MOE of transportation impact across California. As of July 1, 2020, all CEQA lead agencies must analyze a project's transportation impacts using VMT (Caltrans 2019). Utilizing LOS as the primary method of determining transportation impacts is acceptable until July 1, 2020. Humboldt County has not yet adopted VMT thresholds against which the Project would be compared; however, draft thresholds were introduced at the August 20, 2020 Planning Commission Meeting. See Section b), below for a more detailed description of the VMT analysis performed for this document.

2. Further into the Transportation section of the DEIR, I noted the Vehicle Miles Traveled ("VMT") analysis section cites just two policies as specifically supporting roundabouts--C-P34 and C-1M18. Yet that Circulation Plan and EIR for those two policies were approved in 2017 with no VMT analysis.
In fact, all of policies cited in the Analysis all were developed using Level of Service analysis, and none used Vehicle Miles Traveled. My assertion is that one cannot cite County roundabout policies as supporting this DEIR's Transportation VMT analysis of a roundabout, when the roundabout policy was developed no VMT analysis, and in fact used the now-banned LOS analysis. Do you disagree? If so, why?

Humboldt County

A small portion of the Project Area at the Jacoby Creek Road intersection is located within the jurisdiction of Humboldt County. The Project is consistent with the Humboldt County General Plan Circulation Element (2017) and is supported by the following policies:

- C-P34 Use traffic calming measures where feasible to improve safety for all users, including roundabouts.
- C-1M18 Use roundabouts to ease congestion and provide a safe multi-modal circulation system.

15-1 Cont.

Finally, the actual analysis of Significance on VMTs is a single, unsupported sentence: "Because the proposed Project would not increase the length of roadway, add new roadways, or increase the number of travel lanes, there would be no increase in vehicle miles traveled."

I assert that the VMT DEIR analysis of a roundabout must perform an actual, original study of VMT impacts to an approved Standard, or it is arbitrary, and the analysis must be supported by evidence and facts, not Staff opinion. Further, the analysis should include not just length of roadway, new roadway and travel lanes, but also:

1. Do roundabouts accomplish a reduction of Vehicle Miles Traveled?
2. Would Vehicle Miles Traveled be better reduced with a Best Practices for Pedestrians approach? Roundabouts are not on the list.
3. Would Vehicle Miles Traveled be better reduced with a Best Practices for Bicycles approach? Roundabouts are not on the list.

Impact TR-b: **Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)? (Less Than Significant)**

Section 15064.3, subdivision (b), of the CEQA Guidelines lists the criteria for analyzing transportation impacts from proposed projects. The criteria are broken into four categories, including land use projects, transportation projects, qualitative analysis, and methodology. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. This section was recently added by the state legislature in an attempt to separate CEQA's purpose and role from traffic or other issues related to ease of use of single occupancy vehicles. For this reason, impacts to parking are not analyzed as an environmental impact in the section or in other areas of this document. For roadway capacity

15-1 Cont.

projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. Because the proposed Project would not increase the length of roadway, add new roadways, or increase the number of travel lanes, there would be no increase in vehicle miles traveled. By promoting multi-modal transportation, the Project would reduce vehicle miles traveled through the Project Area. The impact would be less than significant.

Mitigation Measures: No mitigation is necessary

Level of Significance: Less than significant

Thank you for responding to these questions. I encourage you to hire a VMT consultant for this EIR--it appears this necessity has been delayed by the City of Arcata and Humboldt County beyond the legal requirements of the State.

Thank you,
Sean

Sean Armstrong
(he/him for business, but occasionally she/her)
Managing Principal
Redwood Energy
[redacted]

Grand Prize Winner of the United Nations World Habitat Awards-2017
Grand Prize Winner of the International PCBC Gold Nugget Awards-2016

Winner of the Sustainability Award of the Building Industry Association of Southern California-2017
Winner of the Department of Energy Innovation Award-2015 and 2020
Awards of Merit from the International PCBC Gold Nugget Awards-2016, 2017, 2018 and 2019

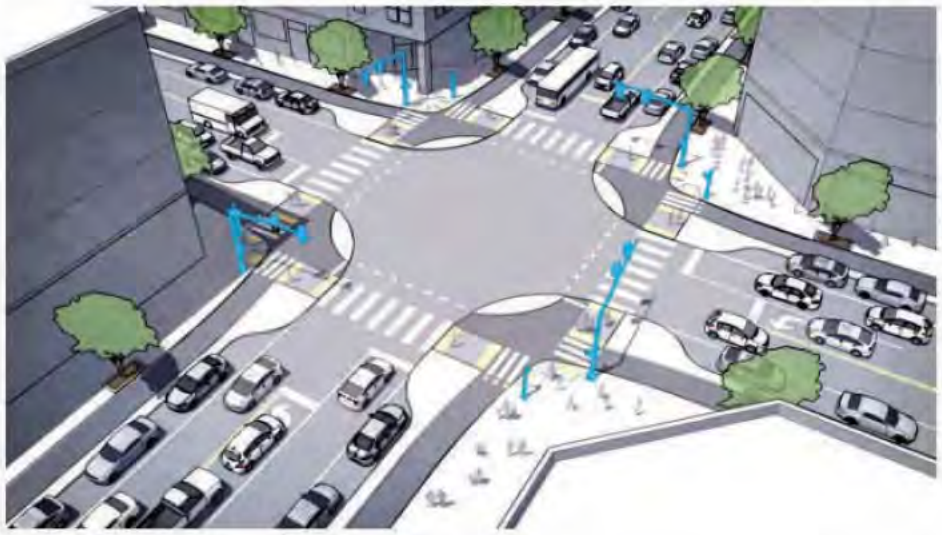
On Fri, Aug 20, 2021 at 4:47 PM Sean Armstrong [redacted] wrote:

Hi Netra,

Thank you for sending the link, and it's great that you're working with VMT analysis now on intersection improvements. As you recall from our work together in the private sector, I've long been designing bicycling and pedestrians roads (Aster Place, Town of Samoa, Beau Pre Heights, etc.) and discouraging cars from using our public rights of way. So I'm surprised that roundabouts haven't yet been reconsidered--they can be made safe, but fundamentally they accelerate cars through an intersection, and are a LOS strategy rather than a VMT strategy. Perhaps this is an opportunity to engage the new resources on pedestrian-encouraging intersections. I recommend this helpful summary, published shortly after VMT became the law in California in 2013. None of the design strategies are round-abouts. :) But "neck-downs" to narrow the road, paired with raised surfacing that visually read as "walkway," are the Best Practices. Hopefully we can move towards best practices. 15-2

Best regards,
Sean

6 Intersection Designs That Actually Prioritize Pedestrians



Sean Armstrong
(he/him for business, but occasionally she/her)
Managing Principal
Redwood Energy
[redacted]

Schedule a meeting with me at: [redacted]

Grand Prize Winner of the United Nations World Habitat Awards-2017
Grand Prize Winner of the International PCBC Gold Nugget Awards-2016
Winner of the Sustainability Award of the Building Industry Association of Southern California-2017
Winner of the Department of Energy Innovation Award-2015 and 2020
Awards of Merit from the International PCBC Gold Nugget Awards-2016, 2017, 2018 and 2019

On Fri, Aug 20, 2021 at 4:34 PM Netra Khatri <nkhatri@cityofarcata.org> wrote:

> Hi Sean
>
> Thank you for our interest on this project.

CEQA Guidelines Section 15064.3, subdivision (b)-Transportation Projects- VMT, is one of the criteria used to evaluate the project transportation impact.

Below is the link to draft EIR for the project:

https://www.cityofarcata.org/938/Old-Arcata-Road-Project-Environmental-Re

Please phone/email if you need additional information.

Hope all is well on your side.

Regards

Netra Khatri, P.E.

City Engineer

City of Arcata - *www.cityofarcata.org*

Office: (707) 825-2173

Cell: (707) 267-4287

nkhatri@cityofarcata.org

From: Sean Armstrong [redacted]
Sent: Wednesday, August 18, 2021 11:04 PM
To: Marc Delany [redacted]
Cc: Karen Diemer <kdiemer@cityofarcata.org>; mark.arsenault@dot.ca.gov; Dallas Huston [redacted] Bob Mcpherson <bob.mcpherson@humboldt.edu>; Susan Mcpherson [redacted]; Wilson, Mike <mike.wilson@co.humboldt.ca.us>; Johnson, May <May.Johnson@sen.ca.gov>; Netra Khatri <nkhatri@cityofarcata.org>
Subject: Re: Notice of Availability of Draft Environmental Impact Report (EIR): Old Arcata Road Rehabilitation Project

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Netra,

If you have a moment, could you speak to whether this roundabout EIR is using the mandated "Vehicle Miles Traveled" methodology? I assume so, because the law was passed in 2013 and mandated a phase out of Level of Service analysis from Traffic Studies in July of 2019. But could you clarify whether LOS or VMT is being used in this EIR? 15-3

LOS, by design, speeds up car traffic.

VMT, by design, slows down car traffic.

LOS endangers pedestrians and bicyclists by accelerating cars through intersections.

VMT encourages pedestrians and bicyclists, and actively discourages single occupant cars.

Thanks for any clarification you can provide. For others on this email chain, I'd be happy to get a link to the EIR if Netra doesn't have time to respond.

Best regards,

Sean

Redwood Energy

Sean Armstrong

(he/him for business, but occasionally she/her)

Managing Principal

Redwood Energy

[redacted]

[redacted]

Schedule a meeting with me at: [redacted]

Grand Prize Winner of the United Nations World Habitat Awards-2017

Grand Prize Winner of the International PCBC Gold Nugget Awards-2016

Winner of the Sustainability Award of the Building Industry Association of Southern California-2017

Winner of the Department of Energy Innovation Award-2015 and 2020

Awards of Merit from the International PCBC Gold Nugget Awards-2016, 2017, 2018 and 2019

On Tue, Aug 17, 2021 at 8:00 AM Marc Delany [redacted] wrote:

> Dear Netra,
>
> I am always shocked to see how few people are included in these monumental decisions. I assume that is at the direction of the Director.
>
> I hope we can attend . I hope you get better advice on when and where to sigh your name to a process that voids Brown Act and most required processes. Don't be used Netra.
>
> This is a terrible project. Are you including Alt 1, and no project, the preferred choices (no. 2, and no 1 respectively).
>
> Sincerely,
>
> Marc Delany

On Mon, Aug 16, 2021 at 5:01 PM Kathleen Stanton [redacted] wrote:

> The Chair is recusing himself from the meeting, correct?
>
> So who will be running the meeting?
>
> I think it only fair that the committee see the Alternative Plan you've presented since you provided them with the City's Roundabout choice. If, as you say, the primary focus is on the historic resource impact analysis then why then did you provide the Committee with the Roundabout Design?
>
> I believe the design for the Intersection is tied to the historic resources analysis, especially if someone such as myself, disagrees with the consultant's findings that there are NO impacts to significant historic resources. Because I believe there ARE significant impacts such as the fact that the roadway for the roundabout will come within 20 feet from the front of the Temperance Hall, it is germane that the committee know and see the Alternative that is less impactful in my professional opinion to significant resources.
>
> Thank you,
>
> Kathleen Stanton
>
> [redacted]
>
> > On Aug 16, 2021, at 3:42 PM, David Loya <dloya@cityofarcata.org> wrote:
> >
> > Hi Kathleen,
> >
> > Thank you for the recommendation. We will certainly let the Committee and the public know that there are alternatives being considered in the EIR, but the primary focus of this meeting will be on the historic resource impact analysis.
> >
> > We will have a more structured conversation, potentially with time limits for the public to address the committee. If time limits are imposed, they will be set to two

or three minutes at the Chair's discretion, depending largely on the number of attendees.

Sincerely,

David Loya (him)

Community Development Director

City of Arcata

p. 707-825-2045

www.cityofarcata.org

City Hall is open for business between 11 and 5. Starting July 1, we will be open 9 to 5.

Visitors to City Hall are required to wear a mask inside regardless of vaccination status. Thank you for complying with this local practice.

Some services, such as water bills and police services, are available on-call. Please check our website www.cityofarcata.org for the latest information on accessing City services.

Since this is an evolving situation, please visit the City's COVID-19 website for updates.

<image002.png>

From: Kathleen Stanton [redacted]
Sent: Monday, August 16, 2021 1:25 PM
To: Netra Khatri <nkhatri@cityofarcata.org>; David Loya [redacted]

Subject: Re: Notice of Availability of Draft Environmental Impact Report (EIR): Old Arcata Road Rehabilitation Project

Hello Netra and David,

I see that you included the Draft Design of the Roundabout in the LHP Committee Packet.

I know you both support the Roundabout, but it seems that since we are still in the EIR process and a formal decision hasn't been made,

that perhaps the Committee should also see the Alternative you drafted up a month or so ago? I think that would only be fair.

Also, are the participants going to be limited in the time they have to address the Committee?

Thank you,

Kathleen Stanton

[redacted]

On Aug 15, 2021, at 12:21 PM, Netra Khatri <nkhatri@cityofarcata.org> wrote:

Hello and good afternoon

Hope you all are having a wonderful weekend.

We wanted to remind you all that the Old Arcata Road Rehabilitation Project is scheduled for next week's regular Historic Landmarks Committee on 8/19/2021 at 4:00 pm.

Attached is the agenda with **ZOOM** link information and below is the link to the agenda packet.

http://arcataca.iqm2.com/Citizens/FileOpen.aspx?Type=1&ID=3060&Inline=True

Please phone/email if you need additional information.

Regards

Netra Khatri, P.E.

City Engineer

City of Arcata - *www.cityofarcata.org*

Office: (707) 825-2173

Cell: (707) 267-4287

nkhatri@cityofarcata.org

<image003.jpg><image004.jpg>

From: Delo Freitas
Sent: Monday, August 09, 2021 4:41 PM
To: COM DEV <comdev@cityofarcata.org>
Cc: Catarina Gallardo <cgallardo@cityofarcata.org>
Subject: Notice of Availability of Draft Environmental Impact Report (EIR): Old Arcata Road Rehabilitation Project

Good afternoon,

This email is to provide notice of the comment period for the Environmental Impact Report prepared for the City of Arcata's Old Arcata Road Rehabilitation and Pedestrian/Bikeway Improvement

Project. This email is being sent directly to individuals who have expressed interest in receiving project updates. Notice was also provided through publication in the *Times Standard* (print date Sunday August 8th). Notice will also be provided by direct mailing to adjacent property owners and residents.

An Environmental Impact Report is an environmental document prepared per the California Environmental Quality Act (CEQA) that analyzes potential environmental impacts of a proposed project. This report builds on the analysis included in the Project's Initial Study, which also provided analysis of project impacts. Both documents are available on the City's website at the link below, under the heading titled "Environmental Review".

https://www.cityofarcata.org/720/Old-Arcata-Road-Design-Project

The public comment period of the draft document begins today, August 9th, and will end 5 p.m. on Monday September 27th. Comment on the analysis included in the Environmental Impact Report may be submitted to the City in writing to the Community Development email inbox (comdev@cityofarcata.org). Comments received before the end of the comment period will be formally responded to in writing, and will be made available on the project webpage and will be provided to the City Council with the Final Environmental Impact Report for their review prior to adoption.

The proposed Environmental Impact Report, along with any response to comments received on the draft Environmental Impact Report during circulation, will be considered by the City Council when hearing the project. The date of this hearing will be identified after closing the public comment period and evaluating comments received. You will receive notice of the date of the City Council hearing by email in advance of the meeting.

We appreciate the community's interest and involvement in this project. Summaries of community input gathered to date can be also found on the City's website at the link listed above.

Sincerely,

Delo Freitas | Senior Planner

City of Arcata Community Development Department

Planning | Housing | Economic Development

p. 707.825.2213 **e.** dfreitas@cityofarcata.org

Due to COVID 19, the City has implemented measures to limit in-person contact. City Hall is currently closed to walk-in business. We still strive to provide the full range of city services by phone, email, and web-based services. Since this is an evolving situation, please visit the City's COVID-19 website for updates.

<image005.jpg>

<2021-08-19 Historic Landmarks Committee - Public Agenda-3060.pdf>

Letter 15 – Response to Comments

Response to Comment 15-1

Lack of City and County VMT thresholds

The commenter is requesting information about applicable City and County VMT thresholds and consistency with the City and County General Plans specific to VMT analyses. Neither the City of Arcata or the County of Humboldt has yet adopted thresholds for Vehicle Miles Traveled (VMT).

Projects that result in the potential to increase VMT include:

- Changes in land use
- Expanded roadways (e.g., new roads, additional lanes)
- Private development
- Expanded public service facilities, such as new police stations, new fire stations, or new administrative buildings
- New and expanded parking lots
- Residential development, such as a new sub-division

The proposed Project includes none of the above listed elements and does not include any component that could be characterized as resulting in a potential increase to VMT. To the contrary, the Project will narrow roadways and promote multi-modal transportation. By its very nature, the Project is VMT-reducing. As stated in Section 3.11 (Transportation), Impact TR-b (page 3.11-11), per the California Office of Planning and Research's guidelines for evaluating transportation impacts in CEQA, *for roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements* (OPR 2019). By promoting multi-modal transportation, the Project will reduce VMT throughout the Project Area and would thus not result in an environmental impact under CEQA. Instead, the Project would result in an environmental benefit by reducing the existing VMT through the Project corridor.

PRC 21099 (b) (1), upon which the CEQA VMT guidance is based, specifically states the purpose of the VMT criteria is to promote, "the development of multimodal transportation networks," consistent with the fundamental goals and objectives of the Project as stated in Section 2.3 (Goals and Objectives) on page 2-2. Similarly, the OPR guidance notes the overall purpose of updating CEQA to include VMT analysis is to help achieve California's long-term criteria pollution and greenhouse gas emission goals, based on four strategies that include, "plan and build communities to reduce vehicular greenhouse gas emissions and provide more transportation options (OPR 2019)," which is also directly supported by the Project's goals and objectives related to multi-modal transportation.

Other applicable considerations in the OPR guidance note the criteria for determining the significance to transportation impacts must promote the development of multimodal transportation networks. The core goal and objectives of the Project promote the development of multimodal transportation networks by upgrading and extending the walkway and sidewalks, along with upgraded intersection safety, throughout the Project Area.

Thus, the Project is consistent and entirely on par with the expectations of the OPR guidance for evaluating transportation impacts in CEQA. Lastly, the OPR guidance clarifies that when evaluating impacts to multimodal transportation networks, lead agencies generally should not treat the addition of new transit users as an adverse impact. Therefore, any success the Project ultimately achieves to increasing multi-

modal transit (e.g., additional pedestrians and bicyclists using Old Arcata Road and adjacent bicycle lanes, walkways, and sidewalks) should not be considered an environmental impact under CEQA. This information has been added to the Final EIR errata in Section 4.

Both the City and County General Plans pre-date the 2020 VMT guidance for CEQA. Therefore, related policies in each General Plan continue to reflect the prior Level of Service standards.

The requested information has been clarified. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 15-2

Recommendation for intersection designs that prioritize pedestrians

The comment provides a general reference for intersection designs that better support pedestrians. Thank you for sharing the enclosed reference. No further response is required.

Response to Comment 15-3

Confirmation the VMT methodology was applied in the EIR

The required VMT methodology was applied in the EIR inclusive of the whole of the Project, which includes the roundabout. See Section 3.11 (Transportation), Impact TR-b (page 3.11-11), as was confirmed to the commenter by City staff on August 20, 2021 via email. Please see also Response to Comment 15-1, above. The requested information has been clarified and no additional response or amendment to the FEIR via errata is necessary.

Comment Letter 16

From: Robert C McPherson [redacted]
Date: August 20, 2021 at 7:30:27 AM PDT
To: [redacted] Alex Stillman [redacted] **Cc:** Chris Hamer [redacted] David Loya <DLoya@cityofarcata.org>, Kiriki Delany [redacted] Margaret Gainer [redacted] Sue Moore [redacted] Jenny Auwarter [redacted] Susan McPherson [redacted]
Subject: Hard to believe

Alex and Jill and the entire HLC committee,

As a scientist studying earthquakes for the past 50 years, I have trained myself to make decisions based on factual data. Last night's HLC meeting was hard for me to listen to. You as a committee heard one side of the story, allowed Jude Power to characterize us in a disrespectful light, spewing untruths, disregarded Chris Hamer's letter to await action until both sides are heard, and then went ahead and took action on half of the story. I heard Chris M dismiss local historic preservationist Suzane Guerra's study as information not worthy of consideration. Unbelievable. We weren't allowed to comment on Chris's "expert opinion", for which we had abundant disagreements that we wanted to address. I ask you, if Chris's opinion is so convincing, why not allow our side to question him about his opinion? 16-1

I was also upset with you inferring that we are having a problem with change. Our problem is about poorly thought out change, meetings that suppress exchange of facts, and staff forcing a hardscape in our neighborhood to solve a problem that doesn't exist. Why do we need a roundabout? Are there other less impactful solutions? 16-2

I am still shocked that you couldn't even determine from your packet that the current road bed does move eastward toward a historic building housing school children (notice parked cars covered by roundabout), within approximently 30 feet of the kids' classroom!! No consideration of increased noise, increased air pollution, safety: Nothing. Chris's opinion: No negative impact!!. Wow!! 16-3
Well I am glad the meeting was recorded and the record is there for future scrutiny of the decisions being made by Arcata corridor staff and your committee. We will continue our effort to present our less impactful solution supported by local historic preservationists trying to be heard, amongst other concerns. You should hear our solution, you might like it.

Bob McPherson
Bayside Cares

Letter 16 – Response to Comments

Response to Comment 16-1

City conduct during Historic Landmarks Committee meeting

This comment asserts the City disregarded public opinion during a Historic Landmarks Committee meeting when the evaluation of historical resources completed for the Project was discussed. The public was able to submit written questions pertaining to the evaluation of historical resources, or any other Project element, during public circulation of the DEIR. The City has responded to all written comments received during public circulation herein this Final EIR. No further response is provided.

Response to Comment 16-2

Project justification and need for a roundabout and alternatives thereto

The commenter questions the need for a roundabout and asks about less impactful solutions (alternatives). Please see Master Response 6 regarding the community engagement process. Please also see Section 2.2 of the Project Description (page 2-1) for the justification for the Project. Alternatives to the Project are discussed in Section 4 of the DEIR. As included in Section 4.5 of the Alternatives Analysis (page 4-15), the environmental impacts of the Project and Alternative 2 (Modified T-Intersection) were found to be equivalent. The requested information has been clarified. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 16-3

Disagreement over environmental impact findings

The commenter disagrees that moving the roadway closer to the Mistwood Education Center does not result in negative impacts to noise, air pollution, historical resources, and safety but provides no such evidence to the contrary. Please see Master Response 2 regarding substantial evidence. No further analysis is necessary and no revisions to the EIR are required to be made.

From: O"connell, Gregory [redacted]
To: Delo Freitas; David Loya
Cc: Andrea Hilton; Netra Khatri
Subject: RE: OAR EIR Wetland Synopsis
Date: Monday, August 30, 2021 6:50:22 AM
Attachments: image003.png

Thanks Delo. This is super helpful. If not already included in the project description, I would recommend some level on native landscaping where it will not interfere with safety, line-of-site, etc. I think this may be better suited as a condition of approval rather than a mitigation measure (if not already part of the project). Thanks again, Greg

17-1

From: Delo Freitas <dfreitas@cityofarcata.org>
Sent: Friday, August 27, 2021 4:32 PM
To: David Loya <dloya@cityofarcata.org>; O'connell, Gregory [redacted]
Cc: Andrea Hilton [redacted] Netra Khatri <nkhatri@cityofarcata.org>
Subject: RE: OAR EIR Wetland Synopsis

Greg:

Happy Friday! Here is a brief summary of wetland impacts:

- The evaluation of potential impacts to biological resources is based on results from the NES completed for the Project, which includes by appendix a wetland delineation, rare plant evaluation, and ESHA evaluation (Northstar Environmental 2019; Appendix D – Natural Environment Study). A wetland delineation update completed on June 23, 2021 focused on a small area near the intersection of Old Arcata Road and Jacoby Creek Road where a small wetland had been delineated in 2018, located outside the Coastal Zone. The area is commonly used for parking and is highly impacted by ongoing roadside use. The updated 2021 delineation concluded the evaluated area did not meet three-parameter wetland criteria, and an updated Preliminary Jurisdictional Determination (PJD) and the updated GHD (2021) report was submitted to the USACE for review. The USACE concurred and issued a jurisdictional determination (USACE 2021). *(DEIR pg 3.3-23)*

- The BSA consists of two types of identified U.S. Army Corp of Engineers (USACE) jurisdictional wetlands that were classified using Cowardin nomenclature from Classification of Wetlands and Deepwater Habitats of the United States (Federal Geographic Data Committee 2013 cited in GHD 2021), Palustrine Emergent Persistent Wetlands and Palustrine Broad-leaved Deciduous Scrub-Shrub Wetlands. The Palustrine Emergent Persistent Wetland consisted

primarily of an herbaceous layer and the Palustrine Scrub-Shrub, Broad leaved Deciduous Wetlands consisted of tree, shrub, and herbaceous vegetation layers. Willow species (Salix spp.) were the dominant trees in the shrub-scrub wetlands often occurring with Himalayan blackberry (Rubus armeniacus) and California blackberry (Rubus ursinus) in the shrub layer.The BSA also contains one-parameter wetlands meeting Coastal Commission requirements based only on wetland (FAC or wetter) vegetation (lack of hydric soils and wetlands hydrology). No two-parameter wetlands were identified. *(DEIR pg 3.3-26)*

- Reflective of the 2021 wetland delineation update, approximately 0.16 acres of three-parameter Palustrine Emergent Persistent Wetlands, 0.24 acres of three-parameter Palustrine Broad-leaved Deciduous Scrub-Shrub Wetlands, and 0.08 acres of one-parameter Willow Series were identified within the BSA (not including the area where the willow canopy dripline extended over pavement). These wetlands were entirely omitted from the construction boundary to avoid potential impacts. Wetland impacts would not occur. *(DEIR pg 3.3-27)*

I've enclosed the preliminary jurisdictional determination from USACOE and associated maps, as well as the draft Bio Resources section for your review.

Please let me know if you have additional questions.

Delo Freitas | Senior Planner
City of Arcata Community Development Department
Planning | Housing | Economic Development
p. 707.825.2213 e. dfreitas@cityofarcata.org

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From: David Loya <dloya@cityofarcata.org>
Sent: Thursday, August 26, 2021 4:58 PM
To: O'connell, Gregory [redacted] Delo Freitas <dfreitas@cityofarcata.org>
Cc: Andrea Hilton [redacted] Netra Khatri <nkhatri@cityofarcata.org>

Subject: OAR EIR Wetland Synopsis

Delo,

Can you provide Greg a synopsis of the EIR analysis on wetland impacts and any mitigations necessary? Please provide relevant sections of the EIR, the delineation, and the ACOE jurisdictional determination.

Thank you.

David Loya (him)
Community Development Director
City of Arcata
p. 707-825-2045
www.cityofarcata.org

City Hall is open for business between 11 and 5. Starting July 1, we will be open 9 to 5.

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Letter 17 – Response to Comments

Response to Comment 17-1

Incorporation of native landscaping

The California Department of Fish and Wildlife (CDFW) recommends incorporation of native landscaping where it will not interfere with safety as a condition of project approval. The City will incorporate native plant species in all landscape areas as practicable as possible.

From:	Susan M Cashman
To:	COM DEV
Subject:	Old Arcata Rd. rehab. and ped. / bikeway improvements plan
Date:	Tuesday, September 07, 2021 2:03:20 PM
Attachments:	Old Arcata Rd. rehab lett SMC 9-7-21.docx

David Loya, Community Development Director
City of Arcata,
736 F Street
Arcata, CA 95521

September 7, 2021

Dear Mr. Loya,

As a resident of the immediate project area for the Old Arcata Road rehabilitation project I STRONGLY SUPPORT THE OLD ARACTA ROAD REHABILITATION PEDESTRIAN/BIKEWAY IMPROVEMENTS PROJECT, INCLUDING THE PROPOSED ROUNDABOUT AT THE INTERSECTION OF JACOBY CREEK ROAD AND OLD ARCATA ROAD.

My experience and opinion are based on:

1) Residence in the immediate project area (my address is 1778 Golf Course Rd.) for 36 years
2) Parent of two children who walked to Jacoby Creek School and back daily for 8 years each
3) Frequent (>2 times / week) pedestrian on Old Arcata Road, most commonly on the stretch between Golf Course Rd. and the Bayside Post Office
4) Frequent (>2 times / week) bicycle commuter and recreational rider on Old Arcata Rd., most commonly the stretch between Golf Course Rd. and Buttermilk Ln. – currently an abysmally rough and patched stretch of pavement

Aspects of the proposed walkway construction and repaving that I find most important: 18-1

1) Construction / extension of a shared use walkway on the west side of Old Arcata Rd. that is separated from the roadway.
2) Construction of bike lanes on both sides of Old Arcata Rd. that are reliably bike lanes, not parking spaces. Parked cars in existing “bike lanes”, common on the west side of the road, force cyclists to merge suddenly into the flow of traffic.
3) Construction of a roundabout at the intersection of Jacoby Creek Rd. and Old Arcata Rd. The roundabout is needed to slow northbound drivers down as they approach the Jacoby Creek Rd. intersection, the post office, and the school.

Thank you and Arcata City staff for all the work you have done to design this project and bring it close to completion.

Susan Cashman

Letter 18 – Response to Comments

Response to Comment 18-1

Letter of support

The commenter is stating their support for the project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

From: Harvey Kelsey
To: COM DEV
Subject: Attached is a comment letter pertaining to the Draft EIR for the Old Arcata Road project
Date: Tuesday, September 07, 2021 2:17:34 PM
Attachments: letter to David Loya from Harvey Kelsey re Draft EIR.docx

David Loya,

Please find attached a comment letter pertaining to the Draft EIR for the Old Arcata Road project.

I would appreciate an acknowledgment that you received this letter and that an electronic version is sufficient in order to be entered into the record. 19-1

Thank you for your time,

Harvey Kelsey

September 7, 2021

David Loya, Community Development Director
City of Arcata
736 F Street
Arcata, CA 95521
707-825-5955. comdev@cityofarcata.org

Re: Old Arcata Road Rehabilitation & Pedestrian/Bikeway Improvements Project
Draft Environmental Impact Report (EIR), August 2021

Dear Mr. Loya,

I am in strong support of the draft EIR *as is* and opposed to project alternatives.

I especially support the construction of a roundabout at the intersection of Old Arcata Road and Jacoby Creek Road (herein referred to as "the intersection"). The roundabout provides improved safety for bicyclists and pedestrians and especially will slow down traffic entering Bayside from the south.

I realize I am only one vote but I am an informed vote as relates to this issue. I live on Golf Course Road only 2/10s of a mile from the intersection (as the crow flies). I regularly bike through that intersection. Multiple times a week, I visit the post office at that intersection. I served on the Jacoby Creek School Board for six years; student safety and vehicle flow past the school and into and out of the school's parking lot is a recurrent concern. Our two children grew up in Bayside and attended the local public school. Each of them used Old Arcata Road to walk to Jacoby Creek school for eight years while they attended elementary and junior high school.

19-1 Cont.

Some people drive too fast on Old Arcata Road between the intersection and the school (and further to the north as well). By 'too fast', I mean roughly in excess of 35 mph, which is already 20 mph over the speed limit. I believe a roundabout, while it may not solve all of the speeding problem, will significantly reduce speed. Less speed means decreaed probability of a serious injury, or fatality, resulting from a pedetrian/cyclist – vehicle collision.

19-2

I am especially attuned to the latter issue because 14 years ago almost to this day, I was hit, in a bike lane, by a speeding vehicle. After the accident, which was a hit-and-run (observed by witnesses), I underwent two major operations on my left

arm, I lost three months of work time and underwent more than three years of rehabilitation order to get my arm back. Inches more of vehicular swerve and I would have been another casualty. In that alternative scenario, the subsequent lives of my two daughters and my wife would have been very different.

We as a community need to take every opportunity to make our pedestrian and cycle pathways as safe as possible. To conclude and to repeat, I strongly support the draft EIR as is and I am opposed to project alternatives.

Thank you for the opportunity to comment.

19-2
Cont.

Harvey Kelsey
[redacted]

P.S. I assume that an electronic version of this letter is sufficient to be entered into the record. If not, please let me know and I will print out and send via snail mail a hard copy of this letter.

Letter 19 – Response to Comments

Response to Comment 19-1

Letter of support

The commenter is stating their support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Response to Comment 19-2

Project design features will reduce speeding throughout the Project Area

The commenter is noting the Project design will help reduce speeding. The City agrees the Project's design features will help to address existing traffic speeds throughout the Project Area. No further response is necessary.

State of California **Transportation Agency**

Memorandum

Date: September 8, 2021

To: Humboldt Area

From: **DEPARTMENT OF CALIFORNIA IDGHWAY PATROL**
Special Projects Section

File No.: 063.A10212.A14585.Noc.Doc

Subject: ENVIRONMENTAL DOCUMENT REVIEW AND RESPONSE
SCH# 2021010176

Special Projects Section (SPS) recently received the referenced "Notice of Completion" environmental impact document from the State Clearinghouse (SCH).

Please use the attached checklist to assess its potential impact to local Area operations and public safety. If it is determined that departmental input is advisable, your written comments referencing the above SCH number must be sent to the lead agency and emailed to state.clearinghouse@opr.ca.gov. Your written comments must be received by SCH no later than **September 13, 2021.** For reference, additional information can be found in General Order 41.2, Environmental Impact Documents.

20-1

For project tracking purposes, SPS must be notified of the assessment of the project (including negative reports). Please email a copy of the response to EIR@chp.ca.gov. For questions or concerns, please contact Mary H. Uhazi at (916) 843-3370.

G. N. Hawkins, for

L. NARVAEZ, SSM III
Commander

Attachments: Checklist
Project File

cc: Northern Division

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2021010176

Project Title: Old Arcata Road Rehabilitation and Pedestrian/Bikeway Improvements

Lead Agency: City of Arcata — Contact Person: David Loya
Mailing Address: 736 F Street — Phone: (707) 822-5955
City: Arcata — Zip: 95521 — County: Humboldt

Project Location: County: Humboldt — City/Nearest Community: Arcata
Cross Streets: n/a-project is a roadway — Zip Code: 95501
Longitude/Latitude (degrees, minutes and seconds): -124 ° 3 ' 36 " N / 40 ° 50 ' 34.8 " W Total Acres:
Assessor's Parcel No.: n/a — Section: 4 — Twp.: T5N — Range: R1E — Base:
Within 2 Miles: State Hwy #: 255 — Waterways: North Jacoby Creek, Beith Creek
Airports: n/a — Railways: n/a — Schools: Jacoby Creek School

Document Type:

CEQA: ☐ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☒ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ☐ Other:
NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI
Other: ☐ Joint Document ☐ Final Document ☐ Other:

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☒ Coastal Permit ☐ Other:

Development Type:

☐ Residential: Units Acres
☐ Office: Sq.ft. Acres Employees
☐ Commercial: Sq.ft. Acres Employees
☐ Industrial: Sq.ft. Acres Employees
☐ Educational:
☐ Recreational:
☐ Water Facilities: Type MGD
☒ Transportation: Type Roadway Rehabilitation& Bike/Ped Improvements
☐ Mining: Mineral
☐ Power: Type MW
☐ Waste Treatment: Type MGD
☐ Hazardous Waste: Type
☐ Other:

Project Issues Discussed in Document:

☒ Aesthetic/Visual ☐ Agricultural Land ☒ Air Quality ☒ Archeological/Historical ☒ Biological Resources ☐ Coastal Zone ☐ Drainage/Absorption ☐ Economic/Jobs
☐ Fiscal ☐ Flood Plain/Flooding ☐ Forest Land/Fire Hazard ☒ Geologic/Seismic ☐ Minerals ☐ Noise ☐ Population/Housing Balance ☐ Public Services/Facilities
☐ Recreation/Parks ☐ Schools/Universities ☐ Septic Systems ☐ Sewer Capacity ☐ Soil Erosion/Compaction/Grading ☐ Solid Waste ☒ Toxic/Hazardous ☒ Traffic/Circulation
☐ Vegetation ☒ Water Quality ☐ Water Supply/Groundwater ☐ Wetland/Riparian ☐ Growth Inducement ☐ Land Use ☒ Cumulative Effects ☐ Other:

Present Land Use/Zoning/General Plan Designation:

n/a -public roadway

Project Description: *(please use a separate page if necessary)*

The Project would improve motorized and non-motorized transportation and user safety in Bayside, California. The proposed project includes road resurfacing, a paved walkway, sidewalks and curb ramps, crosswalks, speed humps, lighting, signage, a retaining wall, and stormwater drainage and infrastructure improvements. Particular constraints within the project alignment may warrant adjustments to the standards to address site-specific issues. See attached page for complete project description.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Project Description

The Project would improve motorized and non-motorized transportation and user safety in Bayside, California. The project would link critical activity centers within the community, including schools, neighborhood facilities, and residential areas.

The project would repave Old Arcata Road, including bike lanes on both sides of the roadway alignment, and improve and extend an existing shared use walkway along the west side of Old Arcata Road from approximately 600 feet south of the Buttermilk Road Roundabout and extending south to approximately 300 feet beyond the Jacoby Creek Road intersection. The total project length is approximately one mile.

The project includes intersection and pedestrian safety improvements along Old Arcata Road, including sidewalk and walkway improvements, curb ramps, curbs and gutters, speed humps, and enhanced crosswalks. New pavement would extend into residential and commercial driveways along Old Arcata Road to ensure smooth transition between existing and new pavement elevations. Construction of a new sidewalk along approximately 375 feet of Hyland Street is also included in the project.

The project includes improvements to the underground storm drain infrastructure that extends along the length of planned improvements in discrete locations. Improvements include new and upgraded storm drain catch basins, storm drain piping, and storm drain junction boxes. The project may include the replacement of sanitary sewer laterals and the installation of cleanouts. The project may also include the replacement of water service connections and resetting/installation of water meters within City/Public right of way.

A new roundabout would be constructed near the southern terminus of the project at the intersection of Jacoby Creek Road. Crosswalks, signage, lighting, and paved walkways would be integrated into the roundabout. A new retaining wall would extend along the west side of Old Arcata Road from approximately 100 feet just north of the proposed Jacoby Creek Roundabout. Modifications and repaving of the roadway that serves the Bayside Post Office may also be required.

The project would terminate approximately 300 feet south of the proposed Jacoby Creek Roundabout along Old Arcata Road. The Jacoby Creek Road pavement improvements would terminate approximately 400 feet east of the proposed roundabout.

The project also includes approximately 1,600 sq-feet of onsite wetland creation within the roadside right-of-way (areas adjacent to the proposed project).

The Project is being designed in accordance with the American Association of State Highway and Transportation Officials (AASHTO) A Policy on Geometric Design of Highways and Streets, 7th Edition (2018). In addition, the Project would be designed in accordance to other specific applicable standards, including the California Manual on Uniform Traffic Control Devices (CA MUTCD 2020); the 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design; the 2019 California Building Code and portions of the Caltrans Highway Design Manual, 7th Edition (2020).

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".
If you have already sent your document to the agency please denote that with an "S".

X	Air Resources Board	X	Office of Historic Preservation
	Boating & Waterways, Department of		Office of Public School Construction
	California Emergency Management Agency		Parks & Recreation, Department of
X	California Highway Patrol		Pesticide Regulation, Department of
X	Caltrans District # 1		Public Utilities Commission
	Caltrans Division of Aeronautics	X	Regional WQCB # 1
	Caltrans Planning		Resources Agency
	Central Valley Flood Protection Board		Resources Recycling and Recovery, Department of
	Coachella Valley Mtns. Conservancy		S.F. Bay Conservation & Development Comm.
	Coastal Commission		San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
	Colorado River Board		San Joaquin River Conservancy
	Conservation, Department of		Santa Monica Mtns. Conservancy
	Corrections, Department of		State Lands Commission
	Delta Protection Commission		SWRCB: Clean Water Grants
	Education, Department of		SWRCB: Water Quality
	Energy Commission		SWRCB: Water Rights
X	Fish & Game Region # 1		Tahoe Regional Planning Agency
	Food & Agriculture, Department of		Toxic Substances Control, Department of
	Forestry and Fire Protection, Department of	X	Water Resources, Department of
	General Services, Department of		
	Health Services, Department of	X	Other:
	Housing & Community Development		Other:
X	Native American Heritage Commission		

Local Public Review Period (to be filled in by lead agency)

Starting Date August 9, 2021 Ending Date September 27, 2021

Lead Agency (Complete if applicable):

Consulting Firm: GHD, Inc.
Address: 718 3rd Street
City/State/Zip: Eureka, CA 95501
Contact: Andrea Hilton
Phone: 707 267 2279

Applicant:
Address:
City/State/Zip:
Phone:

Signature of Lead Agency Representative: Date: 8/3/21

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

Letter 20 – Response to Comments

Response to Comment 20-1

Copy of noticing

The comment provides a copy of the Project's Notice of Completion document and directs comments to the State Clearinghouse. This comment accurately provides the Project's Notice of Completion document, but does not comment on the content or adequacy of the Draft EIR. Improvements to benefit public safety are key objectives of the Project. Please see Section 2.3 (Goals and Objectives) on page 2-2. No further response is necessary.

Comment Letter 21

From: Parker, Gabriel [redacted]
Sent: Monday, September 13, 2021 10:12 PM
To: David Loya <dloya@cityofarcata.org>
Cc: state.clearinghouse@opr.ca.gov; CHP-10AAdesk [redacted] Uhazi, Mary [redacted]
<MUhazi [redacted] Morris, Shawn [redacted]
Subject: SCH# 2021010176 Environmental Document Review

Good evening,

The California Highway Patrol (CHP) Humboldt Area recently received a request to review and respond to the Old Arcata Road Rehabilitation and Pedestrian/Bikeway Improvements Project. At the project location, the roadway improvements are within the city limits of Arcata. Due to the project location proximity to the CHP Humboldt Area, there will be a minor impact to the access of certain parts of the unincorporated Humboldt County within CHP jurisdiction. However, there are several alternate routes to these parts of the county which results in minimal impact to CHP operations. The CHP's primary concern pertains to potential traffic congestion on Old Arcata Road in the immediate area of the project affecting the communities of Sunny Brae and Bayside. It is anticipated Arcata City Roads will utilize one-way traffic control measures to mitigate traffic concerns during this project which should cause only minimal traffic delays. The CHP Humboldt Area recommends the hours of operation for this project occur overnight and during off-commute hours to best reduce any possible traffic surge through the City of Arcata. 21-1

Please advise if there are any questions or concerns.

Thank you,

Sergeant Gabriel Parker
California Highway Patrol
Humboldt Area
[redacted]

From: David Loya <dloya@cityofarcata.org>
Sent: Wednesday, September 15, 2021 2:32 PM
To: Parker, Gabriel [redacted]
Cc: Netra Khatri <nkhatri@cityofarcata.org>; state.clearinghouse@opr.ca.gov; CHP-10AAdesk [redacted] Uhazi, Mary [redacted] Morris, Shawn [redacted]
Subject: RE: SCH# 2021010176 Environmental Document Review

[**Warning:** This email originated outside of CHP. Do not click links or attachments unless you recognize the sender and know the content is safe.]

Dear Sgt. Parker,

Thank you for reaching out, and for providing recommendations. I've cc'd City Engineer, Netra Khatri, who will ensure appropriate coordination with CHP and requirements to contractors during construction.

Please feel free to reach out directly to him if you have additional questions or concerns.

Sincerely,

David Loya (him)
Community Development Director
City of Arcata
p. 707-825-2045
www.cityofarcata.org

Letter 21 – Response to Comments

Response to Comment 21-1

Recommendation for work hours

The California Highway Patrol recommends the hours of operation (presumably, construction) for the Project occur overnight and during off-commute hours. Per Section 2.6.1 of the Project Description (page 2-6), construction will be limited to the hours of 8:00 a.m. through 7:00 p.m., Monday through Friday. On Saturdays, construction will not commence until 9:00 a.m. These hours have been established to limit noise exposure to residents living along the Project corridor, and thus construction during nighttime hours will not be possible. However, a Temporary Traffic Control Plan would be developed prior to Project implementation to ensure flow of traffic along the Project corridor. Additionally, Mitigation Measure TR-1 has been included into the Project to ensure emergency access is maintained. Mitigation Measure TR-1 also requires advanced notice be provided to emergency responders (see page 3.11-13). The pertinent information has been clarified, and the City has shared relevant information pertaining to the required Traffic Control Plan and Mitigation Measure TR-1. The requested night time construction will not be feasible. No further response is provided.

Comment Letter 22

From: Caroline Lowry
To: David Loya; COM DEV
Subject: OAR improvement project
Date: Wednesday, September 15, 2021 8:42:19 AM

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello,
I live on Graham Road and use Old Arcata Road daily by car, bike and sometimes walking or running. I have two young children who will be using the road more independently in the coming years. I would very much like to see the safety improved. I hope to see the roundabout in place soon as well as improved road surface and fog striping.
Thank you.
-Caroline Lowry

22-1

Letter 22 – Response to Comments

Response to Comment 22-1

Letter of support

The commenter is offering their support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Comment Letter 23

From: Amy Bruce
To: David Loya
Cc: COM DEV
Subject: OAR Rehab & Pedestrian Bikeway Improvements Project
Date: Thursday, September 16, 2021 12:17:47 PM

Hello,
I'm writing today to voice my very strong support for the OAR Rehab & Pedestrian Bikeway Improvements Project. I have lived [redacted] since 2013, both of my children attended Jacoby Creek School. So, I have witnessed for years the crazy congestion of cars, cyclists and pedestrians in our neighborhood. Over 400 children and their families make their way to school every day. Many, many residents walk and bike OAR. Every day they battle an unsafe roadway filled with cars, many traveling above the speed limit. Everyone has a close call story to share.

The lower portion of Hyland where it intersects with OAR represents a huge hazard, with 2 school crosswalks and a cafe directly across from JCS. We desperately need a sidewalk. Many young children navigate this stretch on their own. Cars use the lower portion of the road to make U-turns, and the uphill left turn of the road makes visibility poor. 23-1

I have heard there are neighbors that oppose the project because their fences and shrubs would need to be removed and replaced. Well, you can't replace the life of a child in the event of a fatal accident.

Please, after all these years, I urge the City to move forward as quickly as possible with this long overdue project.

Thank you,

Amy Bruce
[redacted]

Letter 23 – Response to Comments

Response to Comment 23-1

Letter of support

The commenter is offering their support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

From: [redacted]
To: David Loya
Cc: COM DEV
Subject: Public Comment to Draft EIR for Old Arcata Road Improvement Project
Date: Saturday, September 18, 2021 3:45:39 PM
Attachments: Letter to City of Arcata about road improvement project-Sept 2021.docx

Attached please find my public comment to the Draft EIR (SCH2021010176) regarding the Old Arcata Rd Improvement Project. I am in favor of moving forward with Project Version Number One.

September 18, 2021

To: David Loya, Arcata Community Development Director

From: Rose Gale-Zoellick, [redacted]

Re: Old Arcata Road Rehabilitation – Draft EIR Public Review and Comment

This is a letter of support for the Old Arcata Road Improvement Project Version Number One. I have lived at 1766 Old Arcata Road in Bayside for 23 years. Our home is the third house to the north of the Bayside Post Office, on the same side of the street. The changes proposed in the Draft EIR directly impact my home and the safety surrounding it. I am eager for the proposed improvements to the roadway in my neighborhood. For years, as speeding vehicles come around the corner that is the intersection of Old Arcata and Jacoby Creek, I hold my breath and say a little prayer that the cars won't come veering off the road and into our home. It may be irrational, but the story of the man killed in his bed on Humboldt Hill by a drunk driver haunts me, as I think "that could be me or someone I love". People have gone off the road and run into the mailbox in front of the Bayside Post Office. I believe the round-about is the best solution to effectively slow the traffic coming from Jacoby Creek Road and coming from Eureka. 24-1

I'm also a regular, early morning dog walker along Old Arcata Road to Sunny Brae. Even though early morning traffic is sparse, I still feel a great sense of relief when I walk on the sections which already have sidewalks. I look forward to my neighborhood having sidewalks.

My last point is about the historical and aesthetic impact of the Project to the rural nature of Bayside. Having grown up and lived in beautiful, quaint historic communities in Vermont and New England, I was glad to see that the Draft EIR found the argument that the Project will have a negative impact to be insignificant. Even in tiny New England villages, smaller than Bayside, the main streets have sidewalks. There, the tourists and locals alike walk the street and are protected from unsafe drivers/driving situations. 24-2

Letter 24 – Response to Comments

Response to Comment 24-1

Letter of support

The commenter is offering their support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Response to Comment 24-2

Historical and aesthetic impacts

The comment identifies the historical and aesthetic impact determinations from the Draft EIR. This comment identifies the impact determinations, and concurs with the determination. No further response is necessary.

Comment Letter 25

From: Kathleen Stanton [redacted]
Sent: Wednesday, September 01, 2021 10:17 PM
To: Netra Khatri
Cc: Susan Mcpherson; Bob Mcpherson; Kiriki Delany; Rebecca Nordquist; Margaret Gainer
Subject: Roundabout brings Old Arcata Rd. 66' closer to Mistwood School Instead of 111' away

Hi Netra,
Our consulting engineer scaled the distance between the Mistwood School before and after the Roundabout & found that Old Arcata Rd. will be 66 feet closer to the school with the construction of the Roundabout which will come within 45 feet of the building. Currently, the school is 111 feet away from the Old Arcata Rd.

We think this is a serious adverse effect to the school and the children who are " sensitive receptors". The building has also been determined eligible for the National Register of Historic Places & the Roundabout will be encroaching on the front facade of this landmark and bring traffic 66 feet closer to within 45 feet of the entrance :(25-1

Per the Engineer..
" Before improvements, Northbound OAR Edge of Travel Way (ETW) is about 111 feet from Mistwood School.
After improvements, NB ETW in the traffic circle and by Jacoby Creek Road will be about 45 feet from Mistwood School.
Comment, the new sidewalk will be 25 feet from Mistwood School.
I scaled this from the 30 percent plans."

We hope to talk about this with you tomorrow on site & in our EIR comments.
Thank you,
Kathleen

Letter 25 – Response to Comments

Response to Comment 25-1

Sensitive receptors and encroachment to historic building

The comment comments shifting the roadway closer to the Mistwood Education Center will increase exposure to students, who are sensitive receptors. The comment lacks substantial evidence. Please see Master Response 2 regarding substantial evidence. Please see Master Response 4 regarding potential noise impacts at this location.

As stated in Draft EIR Section 3.11 (Transportation) Impact TR-b, the proposed Project would not increase the length of roadway, add new roadways, or increase the number of travel lanes, there would be no increase in vehicle miles traveled. As also discussed in Response to Comment 15-1, by promoting multi-modal transportation, the Project would reduce vehicle miles traveled through the Project Area. Thus, the Project would result in reduced emissions in the Project Area, as individuals and families would be more able to safely walk or bicycle throughout the community of Bayside. Draft EIR Section 3.2 (Air Quality) Impacts AQ-b and AQ-c conclude that following construction, the Project would not include any stationary sources of air emissions, traffic capacity enhancements, or any increase in levels of traffic over existing conditions. The proposed roadway improvements will likely increase non-emitting bicycle and pedestrian use of the roadway, which may decrease VMT and associated emissions.

Please see responses to comments submitted in Letter 14 regarding impacts to historical resources, as well as Master Response 7 regarding historical resources.

The City has directed the commenter to the relevant impact analysis in the DEIR and provided clarification in this response. No further analysis is necessary and no revisions to the EIR are required to be made.

Comment Letter 26

From: Michael A Love
To: COM DEV
Subject: Bayside resident in Support of the Old Arcata Road Rehabilitation & Pedestrian/Bikeway Improvements Project
Date: Sunday, September 19, 2021 4:11:56 PM

Dear Mr. Loya

I am writing as a local resident of Bayside within the City of Arcata to support the City's proposed project, which includes pedestrian improvements and a roundabout at the intersection of Old Arcata Road and Jacoby Creek Road. Living in the Bayside community for over 8 years, and often walking and riding bikes with my wife and child around the neighborhood, this intersection has proven dangerous many times. The traffic speeds are excessive, and there is no sidewalk or reasonable shoulder for walking and cycling. Additionally, those turning at this intersection often fail to notice pedestrians and cyclists. Riding my bike to work in downtown Arcata most summer days, I frequently ride through the two roundabouts on Old Arcata Road. I find they tame traffic speeds, make motorists more aware of cyclists, and generally make these busy intersections much safer for all. Based on this experiance, I believe a roundabout at the intersection with Jacoby Creek Road, in combination with that added sidewalks, will make for a much safer intersection for everyone. Therefore, I fully support the Old Arcata Road Rehabilitation & Pedestrian/Bikeway Improvements Project as proposed. 26-1

Sincerely,

Michael Love

[redacted]

--

Michael Love, P.E.

[redacted]

[redacted]

Letter 26 – Response to Comments

Response to Comment 26-1

Letter of support

The commenter is offering their support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

From: Abby [redacted]
Sent: Thursday, August 12, 2021 1:18 PM
To: Netra Khatri <nkhatri@cityofarcata.org>
Cc: Abby [redacted] Stacy Atkins-Salazar <satkinssalazar@cityofarcata.org>; Sarah Schaefer <sschaefer@cityofarcata.org>
Subject: Comments : [redacted]Old-Arcata-Road-Design-Project

Hi,
I have lots of concerns about this project and hope that some of the important issues will be resolved.

The primary issues are vehicle traffic, bike traffic, parking, city services (bus, sewer, sidewalk maintenance), student safety, support for rural school,

I have been to meetings in the past and your city folks hear the information, but the project just goes ahead.

Traffic
With changes to 101 corridor we expect to see more traffic on Old Arcata Road
Does this project need to be done during the 101 construction and changes?
What are alternate routes for folks who live and work in this section of Arcata/ Bayside?

Will Buttermilk-Golf Course Road loop be improved to allow for additional traffic?
What is planned for the intersection on the Bayside Cutoff and Old Arcata Road?

27-1

Bicycles
Walking and biking along Old Arcata Road are a common activity for youth and adults
Students bike to school along this area
The bike lanes are too narrow and are dangerous for young riders
Many students (and some adults) ride on the sidewalk between Bayside Road and Jacoby Creek School now
Could the bike lane be on one side of the road only and be wider to accommodate two way bike traffic?
Could this bike lane be protected from roadway by being next to the sidewalk with the buffer between bike lane and the road?

27-2

Parking
Parking is needed along this roadway.
More parking is needed for Jacoby Creek and the Bayside Community Hall - These are two major businesses on the Old Arcata Road that are impacted by this project
Jacoby Creek School needs parking for staff and parents, plus for community/ school events
There are already traffic back-up issues on the road when school is in session
A parking area or lot with access to the school grounds that does not require students to walk along the road or bike path is needed

27-3

City Services

Sewer

Please add sewer hook ups to the properties that are on Old Arcata Road within this project. There are just a few that the city has not yet resolved (we were told this happening when the initial project took place shortly after buying our home at [redacted] It is not done yet! If you are dealing with the road then this is the time to do this smaller project. All these properties are on Old Arcata Road north of Jacoby Creek School.We have city water but not city sewer. We live within the Arcata city limits. 27-4

Sidewalk

The sidewalks are not maintained and are in use for walking to school and exercise. I have commented before. There is vegetation on the walkway or hanging over and this means that the space is not fully available. If this is not the job of the city then please notice property owners so that they can clear this area. I walk here almost every day. My grandchildren walk from school to my house along this route. This is a safety issue. 27-5

City Bus service

With the addition of the roundabout there is no reason that the city could not have a bus out as far as the roundabout to service residents of this area. It would be helpful for seniors, school employees, and students. This would also help the traffic issues. 27-6

Students Safety and Rural Schools

Please keep safe routes and local schools affected by this project at the top of the list. This includes thinking about the impact during the construction phase of this project. 27-7

Thank you.

Abby Munro-Proulx

[redacted]

Letter 27 – Response to Comments

Responses previously provided to the commenter by the City Engineer have been incorporated into responses below.

Response to Comment 27-1

Traffic impacts related to concurrent construction on US 101

The commenter is concerned that construction of the Project, combined with construction of roadway improvements on US 101, would result in a cumulative impact. The two projects will not necessarily occur at the same time. The City does not have a schedule for US 101 improvements from Caltrans, although they have been ongoing throughout 2021 (e.g., Jacoby Creek bridge replacement). The City's construction of the Project will begin late 2022 or early 2023.

During the City's construction period, Old Arcata Road will not be completely closed. The contractor will provide one way temporary traffic control during construction period. Routing (detouring) traffic via Buttermilk-Golf Course Road loop is not included in this Project. As discussed in Response to Comment 21-1, a temporary Traffic Control Plan would be developed prior to Project implementation to ensure the flow of traffic along the Project corridor.

Currently the planned Project proposes to construct a roundabout at the intersection of the Old Arcata Road and Jacoby Creek Road.

The City has clarified the construction timeline as it relates to construction of roadway improvements on US 101 and other related details. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 27-2

Bicycle lanes

The commenter is inquiring about options for the bicycle lane design. The City needs to provide bike lanes in both directions. One option would be to construct a Class 1 trail along the road alignment, but the City does not have sufficient public right of way. Thus, that option is infeasible.

The current design includes constructing bike lanes on both sides of Old Arcata Road and a walkway on one side of Old Arcata Road, along the project alignment. It is not feasible to construct a buffer between the roadway and the bicycle lane, as the public right of way is not wide enough. The City has addressed the design-related questions in Comment 27-2. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 27-3

Parking

The commenter is discussing the need for parking in the Project Area. Please see Master Response 2 regarding parking. The Project is proposing a widened shoulder on the Jacoby Creek Road in order to accommodate additional on-street parking. The project is also proposing to formalize on-street parking along the west side of the Old Arcata Road where feasible. The City has addressed the design-related questions in Comment 27-3. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 27-4

Request for additional sewer hookups

The commenter is requesting additional sewer hook ups. Installation of an additional sewer line in not in the current scope of the Project. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 27-5

Sidewalks and overgrown vegetation

The commenter is highlighting the existing condition of sidewalks in the Project Area. The Project proposes to improve the condition of sidewalks and walkways throughout the Project Area. Comments related to the existing vegetation maintenance related to private residences on or near sidewalks are not environmental concerns as analyzed under CEQA. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 27-6

Request for City bus service

The commenter is requesting additional City bus service. Currently there is no plan to run City buses to the intersection of Jacoby Creek Road and Old Arcata Road; however if there is demand and need, City will consider that option, unrelated to the proposed Project.

Response to Comment 27-7

Student safety and rural schools

The commenter is asking the City to prioritize safe routes and local school affected by the Project. The goal of the project is to improve safety for all mode of transportations. Please see Section 2.2 of the Project Description regarding the purpose and need of the Project. No further analysis is necessary and no revisions to the EIR are required to be made.

Comment Letter 28

From: Wayne A Palmrose
To: COM DEV
Subject: Old Arcata Road Project
Date: Wednesday, September 22, 2021 3:49:05 PM

To Whom this may concern:

This project leaves me out in the cold side of Arcata.....we don't need this entire project.

You are closing my side of the road, therefore ,I can't even park and mow my lot at 1687 Old Arcata Road. 28-1

How much of my lot are you taking away and I don't need a sidewalk and a grassy path in front of that address. 28-2

Bayside is rural and needs to stay that way--period. 28-3

At Jacoby Creek Road a roundabout is too big, causes a log jamb.

A four way stop would work and be better and cost less that this roundabout that takes away the country feeling. 28-4

As for speed, if CHP and Arcata Police would just enforce the current speed limit, all would improve, and we don't need more

speed bumps.

Thanks,

Wayne Palmrose

[redacted]

Bayside CA 95524

Letter 28 – Response to Comments

Response to Comment 28-1

Parking and mowing

The commenter is concerned about parking and access for mowing. The project would not prevent access to private property or Noga Lane. For 1687 Old Arcata Road, a driveway apron/connection would be provided at the existing gate that serves the parcel. On-street parking would not be permitted on the west side of Old Arcata Road adjacent to the subject parcel. Improvements to the public right-of-way have no direct impacts to the property in question. Please see Master Response 2 regarding parking. Please see Master Response 1 regarding statements unrelated to environmental issues. No further response is necessary.

Response to Comment 28-2

Loss of private landscaping

The commenter is concerned about impacts to private landscaping. Private landowners would not lose portions of yards or landscaping, suffer impacts to driveways, or experience impaired drainage as a result of the project. The proposed project improvements are located within existing public right-of-way (City of Arcata or County of Humboldt). Please see Master Response 1 regarding statements unrelated to environmental issues. No further response is necessary.

Response to Comment 28-3

Rural setting

The comment states Bayside is rural and needs to stay that way. Please see Response to comment 7-3 regarding the aesthetic impact to the community setting. Please also see Master Response 1 regarding statements for or against the project. No further response is necessary.

Response to Comment 28-4

Roundabout size and design

The commenter states the roundabout would be too large and cause a log jam (traffic jam), recommends a four way stop, and discusses speeding. Note while CEQA does evaluate transportation design features that could result in an increase in hazards due to a geometric design feature and emergency access (see Section 3.17 (c) and (d)), CEQA does not evaluate roadway speed or speed enforcement. The goal of the roundabout is to achieve a number of improvements at the intersection of Jacoby Creek Road and Old Arcata Road, in addition to addressing traffic speeds and calming. The design for the safety improvements was selected by the City Council after public scoping and several public design meetings, as summarized in Master Response 6. The City recognizes there are those in the neighborhood and community at large that do not agree with the design decision. These are relevant concerns to raise for consideration of approval but are not environmental issues as analyzed under CEQA. Please see Master Response 1 regarding statements unrelated to environmental issues.

The roundabout will improve traffic flow, increase safety for pedestrians and bicyclists, and enhance roadway-related drainage in the area. These improvements could not be realized by measures limited to reducing only traffic speed, such as increase police enforcement. No further analysis is necessary and no revisions to the EIR are required to be made.

Comment Letter 29

From: Rees Hughes
To: Netra Khatri; David Loya
Cc: Amy Uyeki
Subject: Old Arcata Road Project
Date: Friday, September 24, 2021 8:54:22 AM

Good morning Netra and David,

For the past 25 years, my family and I have lived in the little Brigid Lane subdivision (Bayside Gables) off of Anderson and Old Arcata Road. We raised two daughters here who both attended Jacoby Creek School and over the years have made the crossing of Old Arcata Road on a daily basis.

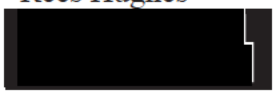
We are excited about the Old Arcata Road Improvement Project between the Buttermilk roundabout and the Jacoby Creek Road intersection. As you know, in addition to the high volume of car traffic, there are many pedestrians and cyclists who utilize the corridor . . . many of whom are school children.

Some years ago, a crosswalk was painted between Anderson Lane on the east and the west side of Old Arcata Road. We have found that this crosswalk gives only the illusion of safety as most drivers ignore the painted crosswalk and still speed through that area. (We have had to dash across the road countless times despite the crosswalk.) I notice in the proposed plans that the painted crosswalk is again included. I am concerned that it is a lost opportunity if something more substantial is not integrated into the changes . . . perhaps an additional speed hump (like the existing speed hump closer to the Buttermilk roundabout which is effective) or a bulb out. 29-1

The bottom line is that just restoring the painted crosswalk does nothing to improve the safety of that crossing.

Thanks.

Rees Hughes



Letter 29 – Response to Comments

Response to Comment 29-1

Letter of support; design recommendations

This comment provides support for the Project and recommendations for Project design, but does not comment on the content or adequacy of the Draft EIR. Please see Master Response 1 regarding statements for or against the project, and statements unrelated to environmental issues. No further response is necessary.

From: Nancy Ihara
To: COM DEV
Subject: Old Arcata Road Project
Date: Thursday, September 23, 2021 10:19:40 AM

A roundabout at the intersection of Jacoby Creek Road and Old Arcata Road would be a great way to enhance safety at that location. I have a friend living on Jacoby Creek Road and am always wary at the left hand turn onto Jacoby Creek Road from Old Arcata Road. Because Old Arcata Road at that point is leaving a more densely populated neighborhood I feel like the cars behind me have begun to speed up while, because I am about to turn into the turn lane, I am slowing down. There is also not great visibility for on-coming cars. I appreciate virtually every roundabout Arcata has installed. They slow traffic and prevent major collisions. I urge you to include the roundabout in the Old Arcata Road Project. 30-1
Nancy Ihara

Letter 30 – Response to Comments

Response to Comment 30-1

Letter of support

The commenter offers support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Comment Letter 31

From:	Gordon Inkeles
To:	Netra Khatri
Cc:	David Loya
Subject:	OAR project
Date:	Thursday, September 23, 2021 11:53:34 AM

Dear Mr. Khatri,

Unfortunately, the thing we feared the most has happened: a cyclist has been hit on Old Arcata Road trying to avoid a trash can. Apparently, he survived with rib fractures and other injuries. The next victim could be killed. JCS schoolchildren still have no sidewalks or safe crossing at the Post Office intersection. And since the road edges are so badly defined, trash cans end up in traffic regularly.

As you know, the project has been delayed again and again while we hold meetings and register opinions. Meanwhile, the Old Arcata Road has become seriously hazardous to both cyclists and walkers. Please expedite the project and take care to avoid last minute modifications that would put us at risk. 31-1

https://nextdoor.com/news_feed/?post=201582329&comment=657224357&init_source=search

Gordon Inkeles
Bayside, CA

cc: David Loya

Letter 31 – Response to Comments

Response to Comment 31-1

Letter of support

The commenter offers support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

From:	Sam McNeill
To:	Chip Sharpe
Cc:	COM DEV; Emily Goldstein; Stacy Atkins-Salazar; Meredith Matthews; Sarah Schaefer; Brett Watson; Celest Armenta; Chip Sharpe
Subject:	Re: In support of Old Arcata Road Improvements
Date:	Thursday, September 23, 2021 4:35:25 PM
Attachments:	Untitled 3.pdf

Well said!
Have you seen this series on YouTube?

32-1

https://youtu.be/M8F5hXqS-Ac

On Sep 23, 2021, at 3:46 PM, Chip Sharpe [redacted] wrote:

[redacted]
Bayside CA 95524-9301
September 23, 2021

To: David Loya, Arcata Community Development Director
and members of Arcata City Council

From: Celestine Armenta & Chip Sharpe

Since 1997, we have lived just a couple hundred feet from Jacoby Creek School. We enjoy seeing students and others as they pass our house walking along the edges of the road.

The frequency with which vehicles drive faster than the posted limits, even when passing pedestrians, and even when groups of children are present along the roadway, is very disturbing. The speed humps have helped to slow most drivers, though some seem willing to hit those bumps at 30 mph or faster and many are seen immediately accelerating toward whatever the next impediment may be.

We are grateful to the City of Arcata for the careful attention to our safety needs in Bayside. This is a wonderful community, and we want to see more folks walking and biking here. Two approaches to safe streets seem to be: 1) Slow the traffic to minimize chances of collisions and limit the damage caused by excessive speeds. and 2) Provide lanes/sidewalks for cyclists/pedestrians separated from the vehicle traffic lanes. The current iteration of the Old Arcata Road Rehabilitation & Pedestrian/Bikeway Improvements Project addresses both approaches. Thank you for listening to our community.

That controlling traffic flow with a roundabout remains controversial is perplexing. We have been driving, walking, and biking in Arcata communities since 1973 and have witnessed significant increase in traffic. The installation of two roundabouts (at Union St and at Buttermilk Rd) have been a blessing. They make crossing when walking safer and easier. The visibility and ease of understanding other drivers' intentions enable bicycle riders and drivers to adjust their speed and easily enter the flow, rarely having to come to a full stop. When roundabouts first appeared, some were puzzled and unsure of when to proceed, but now we are used to them and appreciate the safe, smooth passage through the intersection. From the west side of the Union St roundabout, many cars have exited the freeway and approach the intersection at 50 mph. The roundabout forces them to slow to about 20 mph.

This is exactly what is needed at the Jacoby Creek Rd intersection. Currently, vehicles are headed into Bayside's residential neighborhood from a 45 mph zone at speeds of 50-55 mph and may not slow down until they approach the first speed hump. We will warmly welcome and joyfully use the new roundabout.

We also appreciate the cooperative endeavor between Bayside Community Hall, Mistwood School, and the City of Arcata to redesign available parking areas to accommodate essential parking.

Sincerely,

Celestine Armenta and Chip Sharpe
[redacted]

Letter 32 – Response to Comments

Response to Comment 32-1

Letter of support

The commenter offers support for the Project. The comment states support for the comments provided in Comment Letter 37. Please see Response to Comment 37-1.

From: sueriemcneill@gmail.com
To: Chip Sharpe
Cc: COM DEV; Emily Goldstein; Stacy Atkins-Salazar; Meredith Matthews; Sarah Schaefer; Brett Watson; Celest Armenta; Chip Sharpe
Subject: Re: In support of Old Arcata Road Improvements
Date: Thursday, September 23, 2021 10:18:47 PM
Attachments: Untitled 3.pdf

Hi Chip & Celest,
Excellent letter - I wholeheartedly agree with everything you covered. Thank you!
Suerie

33-1

On Sep 23, 2021, at 3:46 PM, Chip Sharpe [redacted] wrote:

[redacted]
Bayside CA 95524-9301
September 23, 2021

To: David Loya, Arcata Community Development Director
and members of Arcata City Council

From: Celestine Armenta & Chip Sharpe

Since 1997, we have lived just a couple hundred feet from Jacoby Creek School. We enjoy seeing students and others as they pass our house walking along the edges of the road.

The frequency with which vehicles drive faster than the posted limits, even when passing pedestrians, and even when groups of children are present along the roadway, is very disturbing. The speed humps have helped to slow most drivers, though some seem willing to hit those bumps at 30 mph or faster and many are seen immediately accelerating toward whatever the next impediment may be.

We are grateful to the City of Arcata for the careful attention to our safety needs in Bayside. This is a wonderful community, and we want to see more folks walking and biking here. Two approaches to safe streets seem to be: 1) Slow the traffic to minimize chances of collisions and limit the damage caused by excessive speeds. and 2) Provide lanes/sidewalks for cyclists/pedestrians separated from the vehicle traffic lanes. The current iteration of the Old Arcata Road Rehabilitation & Pedestrian/Bikeway Improvements Project addresses both approaches. Thank you for listening to our community.

That controlling traffic flow with a roundabout remains controversial is perplexing. We have been driving, walking, and biking in Arcata communities since 1973 and have witnessed significant increase in traffic. The installation of two roundabouts (at Union St and at Buttermilk Rd) have been a blessing. They make crossing when walking safer and easier. The visibility and ease of understanding other drivers' intentions enable bicycle riders and drivers to adjust their speed and easily enter the flow, rarely having to come to a full stop. When roundabouts first appeared, some were puzzled and unsure of when to proceed, but now we are used to them and appreciate the safe, smooth passage through the intersection. From the west side of the Union St roundabout, many cars have exited the freeway and approach the intersection at 50 mph. The roundabout forces them to slow to about 20 mph.

This is exactly what is needed at the Jacoby Creek Rd intersection. Currently, vehicles are headed into Bayside's residential neighborhood from a 45 mph zone at speeds of 50-55 mph and may not slow down until they approach the first speed hump. We will warmly welcome and joyfully use the new roundabout.

We also appreciate the cooperative endeavor between Bayside Community Hall, Mistwood School, and the City of Arcata to redesign available parking areas to accommodate essential parking.

Sincerely,

Celestine Armenta and Chip Sharpe
[redacted]

Letter 33 – Response to Comments

Response to Comment 33-1

Letter of support

The commenter offers support for the Project. The comment states support for the comments provided in Comment Letter 37. Please see Response to Comment 37-1.

From: Jess O
To: David Loya; COM DEV
Subject: Public comment on EIR for the Old Arcata Road Rehabilitation and Pedestrian/Bikeway Improvements Project
Date: Thursday, September 23, 2021 12:06:47 PM

Hi all,

I'm an Arcata resident and owner of property on Jacoby Creek Road.

After reviewing the plans I'm very much in favor of the Roundabout, new sidewalks, improvements to the roads and adding a left turn lane to Jacoby Creek School parking lot.

My suggestions:

REDUCE SPEEDING! Whatever it takes make people slow down. Period. More speed lumps.

SLOW TRAFFIC by whatever means needed. Old Arcata Road is 25MPH but most people are routinely driving far faster than that.

IMPROVE BIKE AND PEDESTRIAN ACCESS

34-1

SAVE OPEN LANDS AND WETLANDS

34-2

Thanks for your work on this

Sincerely,

Jess O'Brien
Arcata, CA

Letter 34 – Response to Comments

Response to Comment 34-1

Letter of support; design recommendations

The commenter offers support for the Project and includes design recommendations. This comment provides recommendations for Project design, but does not comment on the content or adequacy of the Draft EIR. The Project will be traffic calming and improve multi-modal transportation facilities, including bicycle and pedestrian facilities. Please see Master Response 1 regarding statements for or against the project, and statements unrelated to environmental issues. No further response is necessary.

Response to Comment 34-2

Save open lands and wetlands

The comment requests open lands and wetlands be saved. The Project will not directly or indirectly develop any undeveloped areas or open lands. Please see Master Response 8 regarding wetlands. No further response is necessary.

Comment Letter 35

From: Linda Palmrose
To: COM DEV
Subject: Old Arcata Road Proposed Project
Date: Thursday, September 23, 2021 11:19:45 AM

City of Arcata Community Development

TO WHOM IT MAY CONCERN:

I have been a Bayside resident for 70 years and can tell you there is no need for paved walkways, sidewalks, curb ramps, crosswalks, speed bumps and a roundabout at the junction of Old Arcata Road and Jacoby Creek Road. The area is RURAL. 35-1

Placing an unnecessary roundabout at the junction of Old Arcata Road and Jacoby Creek Road could put someone's life in jeopardy or result in the loss of one's home (fire) due to the inability of emergency personnel being unable to respond in a timely manner. I remember when Kathy Goodman's house caught on fire on Dubeault Road in Bayside and rumor had it that the fire department had to take an alternate route to the fire as the response vehicles would have been considerably slowed down due to the numerous speed bumps and roundabouts along Old Arcata Road. In year 2009, when I was 58 years old, the ladder I was on collapsed and I fell 12 feet landing on my back on the ladder rungs. When I came to, the pain was so bad that I had to scoot to my cell phone. The ambulance technician explained that as it was not known whether my back or wrist was broken, the ambulance would have to take the long route to the hospital as the speed bumps would slow the ambulance down or further injure my back. Luckily, I received good news from the emergency room physician - no broken bones anywhere and I could go home. As I have experienced, seconds do count in an emergency, of which ambulances, fire departments and police need unobstructed roads of which to navigate. As I mentioned above, I have lived in Bayside 70 years and there is no need for a roundabout, sidewalks, walkways and bike lanes. Why doesn't the City just enforce the speed limit? 35-2

As the owner of three parcels between Jacoby Creek School and Jacoby Creek Road (1708 Noga Lane; 1698 Noga Lane and 1687 Old Arcata Road), I want to be able to access and develop my parcels without encumbrances. As we bring a riding lawn mower to the vacant parcel at 1687 Old Arcata Road to mow all three parcels, how in the world are we going to continue mowing our fields if there is a sidewalk and bike lane in front of the parcel where we park our equipment? Is the City going to reimburse me for the loss of my property? 35-3

Please do not ruin Bayside with these costly and totally unnecessary proposals. As someone once said, "A penny saved is a government oversight". Why spend millions of dollars when a simple solution would be to enforce the speed limits. Leave Bayside as it is. **RURAL**. As I mentioned above, I have been a Bayside resident for 70 years and know full well, that this proposed Old Arcata Road project is 100% a waste of time and money. 35-4

Linda Palmrose

Letter 35 – Response to Comments

Response to Comment 35-1

Lack of need for Project design elements

The commenter suggests there is no need for the Project's design elements, as the area is rural. Please refer to Response to Comment 28-3 regarding the Project's consistency with the aesthetic nature of the community. Please also see Master Response 1 regarding statements for or against the project. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 35-2

Emergency access and speed limit enforcement

The commenter advises the roundabout could jeopardize someone's life due to the inability of emergency personnel to respond in a timely manner. Maintaining emergency access is an environmental issue as considered under CEQA. Information pertaining to emergency access can be found in Section 3.17 (d) of the ISMND. Roundabouts are common features in numerous communities (both rural and urban) and have not been found to detrimentally impede emergency access. The roundabout serves additional benefits beyond speed reduction, including improved traffic flow, drainage, pedestrian safety and community walkability, and bicycle facilities.

Please refer to Response to Comment 28-4 regarding speed enforcement and Project safety. The design for the safety improvements was selected by the City Council after public scoping and several public design meetings, as summarized in Master Response 6. The roundabout will improve traffic flow, increase safety for pedestrians and bicyclists, and enhance roadway-related drainage in the area. These improvements could not be realized by measures limited to reducing only traffic speed, such as increase police enforcement. No further analysis is necessary and no revisions to the EIR are required to be made.

Response to Comment 35-3

Access for mowing

The commenter is concerned the Project would conflict with their ability to access private property for purposes of mowing. Please refer to Response to Comment 28-1 regarding property access and mowing. See also Response to Comment 28-2 regarding the Project's location within public right-of-way. Improvements to the public right-of-way have no direct impacts to the property in question. Please see Master Response 1 regarding statements unrelated to environmental issues. No further response is necessary.

Response to Comment 35-4

Opposition to the Project; rural setting

The commenter is stating their request to deny approval of the Project. Please refer to Response to Comment 28-3 regarding the Project's consistency with the aesthetic nature of the community. Please also see Master Response 1 regarding statements for or against the project. No further analysis is necessary and no revisions to the EIR are required to be made.

Comment Letter 36

From: Jean Santi
To: David Loya
Subject: RE:Old Arcata Road Project
Date: Thursday, September 23, 2021 3:05:08 PM

Dear Mr. Loya,
I am writing to you with regard to the changes proposed for Old Arcata Road. In the beginning stages of the project I was able to attend and participate in all of the sessions held to gather public input. I felt that these sessions were well attended and well organized, and I mostly felt that the opinions of the public were "heard". Since then, I have been following the mailings that were sent to participants. Now I am writing because the intersection which is the most danger to myself and my neighbors is one of the places where no real change is going to be made. This is the intersection of Old Arcata Road with Anderson Ln. Just after the initial meetings were held, the city painted a crosswalk at this intersection. No warning signage was posted going either north or south on Old Arcata Rd to warn of this new crosswalk. Therefore, even after all these years, traffic rarely stops for pedestrians or bikers at this crosswalk.

At the time of the meetings I asked the engineers present to analyze this intersection. Cars coming from the south toward Arcata are dangerous here. About 1/4 mile before the intersection Old Arcata Road is at a high point descending to the intersection. In addition, about 100 yards later the road curves slightly eastward so that oncoming traffic has NO visibility and does not see the intersection until arriving at it. Although the speed limit is 25 mph, cars have sped up after the speed bump at the school and are going downhill and arrive at the intersection in question going 35-40 mph. This situation makes pulling out either to the right or left onto Old Arcata Rd hazardous, and crossing on foot, really taking one's life in one's hands. 36-1

Ideally, Old Arcata Road would be leveled out so that the downhill is less steep. The curve would also be straightened out so that visibility would be clear. It seems to me that these two things can still be done since lanes are to be restructured. AT LEAST, a traffic bump should be installed close to the intersection and a flashing miles-per-hour sign installed for north-going traffic. And certainly, given the city's desire to encourage walking and biking (for which reason biking lanes are to be added) sidewalk and curb extensions should be installed on both the east and west sides of the intersection.

As a citizen it is disappointing to have spent several hours participating in the input phase of this project and to finally see that one of the least safe places along the road after the Vet's office is going to remain unsafe. I hope this can be remedied. Thank you.

Jean Santi

Letter 36 – Response to Comments

Response to Comment 36-1

Design recommendations specific to the intersection of Old Arcata Road and Anderson Lane

This comment provides recommendations for safety improvements at the intersection of Old Arcata Road and Anderson Lane, where an existing crosswalk will be upgraded. The City will consider these recommendations as the design progresses. No changes have been made to the EIR.

Comment Letter 37

From:	Chip Sharpe
To:	COM DEV
Cc:	Emily Goldstein; Stacy Atkins-Salazar; Meredith Matthews; Sarah Schaefer; Brett Watson; Celest Armenta; Chip Sharpe
Subject:	In support of Old Arcata Road Improvements
Date:	Thursday, September 23, 2021 3:46:49 PM
Attachments:	Untitled 3.pdf

[redacted]
Bayside CA 95524-9301
September 23, 2021

To: David Loya, Arcata Community Development Director
and members of Arcata City Council

From: Celestine Armenta & Chip Sharpe

Since 1997, we have lived just a couple hundred feet from Jacoby Creek School. We enjoy seeing students and others as they pass our house walking along the edges of the road.

The frequency with which vehicles drive faster than the posted limits, even when passing pedestrians, and even when groups of children are present along the roadway, is very disturbing. The speed humps have helped to slow most drivers, though some seem willing to hit those bumps at 30 mph or faster and many are seen immediately accelerating toward whatever the next impediment may be.

We are grateful to the City of Arcata for the careful attention to our safety needs in Bayside. This is a wonderful community, and we want to see more folks walking and biking here. Two approaches to safe streets seem to be: 1) Slow the traffic to minimize chances of collisions and limit the damage caused by excessive speeds. and 2) Provide lanes/sidewalks for cyclists/pedestrians separated from the vehicle traffic lanes. The current iteration of the Old Arcata Road Rehabilitation & Pedestrian/Bikeway Improvements Project addresses both approaches. Thank you for listening to our community. 37-1

That controlling traffic flow with a roundabout remains controversial is perplexing. We have been driving, walking, and biking in Arcata communities since 1973 and have witnessed significant increase in traffic. The installation of two roundabouts (at Union St and at Buttermilk Rd) have been a blessing. They make crossing when walking safer and easier. The visibility and ease of understanding other drivers' intentions enable bicycle riders and drivers to adjust their speed and easily enter the flow, rarely having to come to a full stop. When roundabouts first appeared, some were puzzled and unsure of when to proceed, but now we are used to them and appreciate the safe, smooth passage through the intersection. From the west side of the Union St roundabout, many cars have exited the freeway and approach the intersection at 50 mph. The roundabout forces them to slow to about 20 mph.

This is exactly what is needed at the Jacoby Creek Rd intersection. Currently, vehicles are headed into Bayside's residential neighborhood from a 45 mph zone at speeds of 50-55 mph and may not slow down until they approach the first speed hump. We will warmly welcome and joyfully use the new roundabout.

We also appreciate the cooperative endeavor between Bayside Community Hall, Mistwood School, and the City of Arcata to redesign available parking areas to accommodate essential parking.

Sincerely,

Celestine Armenta and Chip Sharpe
[redacted]

Letter 37 – Response to Comments

Response to Comment 37-1

Letter of support

The commenter is offering their support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

From: Jim Sousa
To: COM DEV
Subject: Fwd: Comment on OAR Priject EIR
Date: Thursday, September 23, 2021 9:11:21 AM

On Thu, Sep 23, 2021, 8:18 AM Jim Sousa [redacted] wrote:

9/22/21

Greetings,

My name is James Sousa and I am a long term resident of Bayside at 440 Solaris ln.

I am writing in full support of this project.
The current conditions if this project area are unacceptable and hazardous to all users.
The proposal to rehabilitate and improve this section of OAR is long overdue. I was involved in the early stages of the design process over 6 years ago.
As a frequent user, bicycling and driving daily to the Post Office and Arcata to shop, I am especially in favor of the proposed Roundabout to be located at the dangerous intersection of Jacoby Creek Rd and OAR. This will greatly improve safety, especially for pedestrians and bicyclists. I have had several close calls negotiating the current intersection. Vehicles turning in and out of Jacoby Creek Road at speeds well above the posted maximum, inattentive drivers pulling out onto OAR neglecting to obey the Stop sign, have come dangerously close to hitting me on my bicycle traveling on OAR.
The Roundabout will greatly improve safety for all users.
I travel through the Roundabouts located further down OAR with ease and traffic is calmed and flows at a reasonable speed, so that can happen at this intersection as well.
Dedicated bike lanes are much needed to ensure safety. Currently there are cars parked blocking the bike lanes despite signs prohibiting parking or blocking the lanes. This requires bicyclists to veer onto the roadway which is unsafe.
Pedestrians including children walking to/from Jacoby Creek School are ar risk due to a complete absence of sidewalks. The dedicated bike lane and safe sidewalks planned are essential and welcomed.
And the roadbed is degraded and patched up, making additional hazards as Vehicles negotiate through this roadway avoiding large potholes and patches.
It will be a blessing and a relief to travel safely in my neighborhood!
I look forward to this project being implemented in 2022, it can't happen soon enough.
Thanks to City staff, CalTrans and other partners for securing the funds, making the design and encouraging the community to participate.

38-1

Sincerely,
James D. Sousa
Bayside, CA 95524
[redacted]

PS the email address printed on pg5 of Mad River Union is misleading it has a hyphen, I tried 3 times to send this comment and it was returned I finally looked it up..I expect others might have same problem.

38-2

Letter 38 – Response to Comments

Response to Comment 38-1

Letter of support

The commenter is offering their support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

From: Carla Paliaga
To: David Loya; COM DEV
Subject: Old Arcata Road Improvement project
Date: Friday, September 24, 2021 3:35:30 PM

I am writing to express my support for the Old Arcata Road Improvement project. As residents of Old Arcata Road with children whose grandparents live on Jacoby Creek Road, we frequently walk and bike the stretch of road that is slated for improvement. I cannot tell you how many reckless driving behaviors that I see on a regular basis along this stretch of Old Arcata Road. From our house there is no safe way to walk along Old Arcata Road and cross to Jacoby Creek Road. For our child who attends Jacoby Creek School, crossing OAR is a dangerous endeavor. The traffic circle and improved bike lanes will be welcome and appreciated. I have read the extensive EIR and I agree with the findings. The impacts can be mitigated as noted in the EIR. I live on Old Arcata Road a little bit north of Jacoby Creek School and I will be impacted by the construction of these improvements and I am in full support of this project. The inconvenience of construction will be worth a safer Old Arcata Road. I also fully support the sidewalk on Hyland. We have friends who live on Hyland and there is no safe way to walk up the road right now. It is highly utilized during Jacoby Creek drop off and pick up. I am in full support of the walkway on the west side of OAR. I only wish there was also a walkway along the East side as well. I hope this project begins as soon as possible. Thank you for attending to the safety of pedestrians and bikers along OAR. 39-1

Thank you,
Carla Paliaga

Letter 39 – Response to Comments

Response to Comment 39-1

Letter of support

The commenter is offering their support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

From: Steve Mietz
To: David Loya
Cc: Netra Khatri
Subject: Increase the safety of the crosswalk at the intersection of Anderson Lane and Old Arcata Road
Date: Saturday, September 25, 2021 5:05:12 PM

Mr. Loya,

The residents who use the Old Arcata Road as a pedestrian corridor on a daily basis to get children to school, go shopping and enjoy the bay views are eagerly awaiting the improvements to the pedestrian safety being proposed by the city. However, it is disappointing to see that the crosswalk at the intersection of Anderson Lane and Old Arcata Road is not receiving any additional traffic calming, curb extensions or other pedestrian safety items. As a resident on Brigid Lane with school age children that walk this crosswalk on a daily basis, I petitioned the city repeatedly to repaint the crosswalk to increase awareness of drivers of the pedestrians who use this area. There is a turn in the road just to the south of the intersection that creates somewhat of a blind corner and I have had two close calls of almost being hit with my child when in this crosswalk. After two years of contacts with the city, the crosswalk was repainted in the Summer of 2020 which has increased the amount of traffic that now stops for us as we try to cross the busy roadway. This small improvement has made a large difference in mine and my children's safety so I think additional pedestrian safety measures could do better. Many children have moved into the neighborhood that is fed by Anderson lane in the last few years. This Friday afternoon, I counted 6 children and 3 adults use the crosswalk in the short time after school was out. I hope the city will consider the dangerous nature of the crossing and large amount of its use when improving the other aspects of the roadway. 40-1

I am a life long walker and as a daily user of the corridor under consideration, I can tell you that this is the most used section of walkway by pedestrians (for school and also local residents) than just about any walkway I have used at all the places I have lived. When we first moved here over 4 years ago, I commented many times to my out of state friends how surprised I was in the disrepair of the sideway and the lack of a sidewalk on both sides of the roadway for such a major and heavily use pedestrian and bicycle corridor.

Both the size and condition of the sidewalk is not sufficient for its current use. The lack of a safe bike path forces bikes in direct conflict with pedestrians on the sidewalk on a daily basis. In addition, there are many portions of the walkway that have minimal separation from vehicular traffic which leads to many close calls when the school kids are in large packs walking the road to Murphy's and expand out laterally. I have seen cars swerving to miss kids who are adjacent to the walkway and roadway because there is so little separation at some points between cars and people. Getting children safely to school was a high priority when we

lived in Arizona and many pedestrian enhancement projects took place during the time we lived there, increasing both use and safety by pedestrians and the numerous associated benefits of getting more folks out safely walking instead of driving. I am not sure if California has a similar safe to school program but it seems like that would be an ample source of funding to provide support for these efforts.

40-1 Cont.

In my conversations with city officials, it was alluded to that some residents pushed back on any changes to the road way because they wanted to keep the rural character of the road which has slowed the implementation of these critical safety upgrades. I am not sure if this was one or a handful of vocal opponents to this effort, however, I can tell you that I have never heard anyone who thinks the current situation does not require remediation. I can tell you that if you hold a public meeting again on this topic that many residents will come in support of these efforts and desire the quick implementation of these improvements.

40-2

Thank you for consideration of additional pedestrian safety improvements at the intersection of Anderson Lane and Old Arcata Road in your design efforts. Additionally, I implore you to expedite your efforts to design and implement these critical safety upgrades along this corridor; they are timely, desperately needed and well overdue!

40-3

-Steve Mietz

[redacted]

Letter 40 – Response to Comments

Response to Comment 40-1

Design recommendations specific to the intersection of Old Arcata Road and Anderson Lane

Please refer to Response to Comment 36-1.

Response to Comment 40-2

Statement of support

The commenter references debate about the Project within the community and emphasizes their support for the Project, which they feel to be needed. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Response to Comment 40-3

Request to expedite the Project

The commenter requests that the City expedite the Project. The City is working to complete the environmental compliance and design phase of the Project as soon as possible. No further response is required.

Comment Letter 41

From:	James I Zoellick
To:	David Loya
Cc:	COM DEV
Subject:	Comment on the Draft EIR for the Old Arcata Road Rehabilitation and Pedestrian/Bikeway Improvements Project
Date:	Sunday, September 26, 2021 8:29:52 PM
Attachments:	EIR_Comments-OldArcataRdProject-Zoellick.docx

Dear Community Development Director Loya,

Attached please find my comments regarding the Draft EIR for the Old Arcata Road Rehabilitation and Pedestrian/Bikeway Improvements Project.

Thank you.

Jim

Jim Zoellick
[redacted]
Bayside, CA 95524

41-1

Jim Zoellick
1766 Old Arcata Rd.
Bayside, CA 95524

September 26, 2021

David Loya
Community Development Director
City of Arcata
736 F Street
Arcata, CA 95521

Dear Mr. Loya,

Subject: Comments regarding the Draft Environmental Impact Report for the Old Arcata Road Rehabilitation and Pedestrian/Bikeway Improvements Project

My name is Jim Zoellick and I live at 1766 Old Arcata Road in Bayside, CA. I am the homeowner and have lived here for the last 23 years. My wife and I walk our dog daily in our neighborhood and I walk and bicycle frequently in the area. We are huge supporters of the Old Arcata Rehabilitation Project, including the installation of a roundabout at Jacoby Creek Road.

We live three houses north of the Jacoby Creek Road intersection where the proposed roundabout will be installed. The current roadway through Bayside is not safe, particularly for pedestrians and bicyclists. This is especially concerning for the many children who live in our neighborhood and who walk to Jacoby Creek School, Mistwood School, or local school bus stops.

The key roadway safety issues in our neighborhood are a lack of a safe place for pedestrians to walk, insufficient bikeway facilities, and most importantly excessive speeds for traffic passing through the area (i.e., 40 to 50 mph speeds in a 25 mph speed zone). We are supportive of the proposed Old Arcata Road Rehabilitation Project because it will address all these issues.

It is important to note that the proposed roundabout at Jacoby Creek Road is a critical element of the proposed project. Although the EIR for the project identifies Alternative 2 as a feasible alternative, it fails to acknowledge that Alternative 2, which does not include a roundabout, will not successfully slow traffic coming into Bayside from the south and therefore will fail to meet a critical objective of the project. Roundabouts are proven to reduce speeds, reduce accidents, and reduce injuries and deaths at intersections. Without a roundabout at Jacoby Creek Road, Alternative 2 would increase hazards for pedestrians by providing a cross walk near the intersection without successfully slowing speeds. This would effectively create a game of “chicken” for pedestrians; this is clearly not acceptable.

41-1 Cont.

41-2

I have been very active talking with my Bayside neighbors about the proposed project and I contend that there is a strong majority of the Bayside community that is in favor of the proposed project, including the roundabout at Jacoby Creek Road. This is especially true for those who live in the immediate vicinity of the proposed project and roundabout. I have communicated with more than 20 households who live within a half mile of the proposed roundabout. Many of them have children who attend local schools, all of them are concerned about pedestrian and bicycle safety in Bayside, and all of them support the proposed project and roundabout. 41-3

I urge the City of Arcata to approve the proposed project, including the roundabout at Jacoby Creek Road. That is what most of the community wants and is what will best serve Bayside community members and all Arcatans by improving bicycle and pedestrian safety in our town.

Jim Zoellick

Letter 41 – Response to Comments

Response to Comment 41-1

Letter of support

The commenter is offering their support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Response to Comment 41-2

Preference for the Project over Alternative 2

The commenter is stating their preference for the Project over Alternative 2. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Response to Comment 41-3

Letter of support

The commenter is offering their support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Comment Letter 42

From: Kristi Colbert
To: COM DEV
Subject: Old Arcata Road Rehab Project/Roundabout
Date: Sunday, September 26, 2021 7:12:16 PM
Attachments: SupportLetterOldArcataRdRoundabout.pdf

Dear Mr. Loya,,

Please see our letter in support of the Old Arcata Road roundabout attached.

Thank you for your time and all that you do to make our neighborhood safer!

Best,

Bert and Kristi Colbert

42-1

David Loya, Community Development Director
& Arcata City Council Members
City of Arcata
736 F St.
Arcata, CA. 95521

Dear Mr. Loya and Council Members--

We have lived at 1759 Old Arcata Rd., Bayside since 1989. During the last 32 years, we have watched the speeds increase going past our house and motorists accelerating through the turn in front of Jacoby Creek Rd.--in both North and South directions.

We are pedestrians on the road often; both on bike and walking. The road has become dangerous with distracted drivers drifting into the shoulder, many times at high speeds.
We witness drivers regularly going 50 MPH or more in front of our house, even passing other cars.

Please mark us in support of the project as proposed. We don't believe the two other options address the traffic calming while maintaining traffic flow that a roundabout accomplishes. A stop sign at Jacoby Creek Rd. would not only back up traffic when Jacoby Creek School is in session, it would be dangerous and result in high-speed rear impact crashes since drivers are distracted and not expecting to come to an abrupt stop.

Sincerely,

Bert & Kristi Colbert
[redacted]
Bayside, CA. 95524

42-1
Cont.

42-2

Letter 42 – Response to Comments

Response to Comment 42-1

Letter of support

Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Response to Comment 42-2

Support for the Project over the Alternatives evaluated

Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Comment Letter 43

From: Len Mayer
To: COM DEV
Subject: Old Arcata Road Rehabilitation & Pedestrian/Bikeway Improvements Project
Date: Sunday, September 26, 2021 8:48:39 PM

Good evening I am writing to comment on the Old Arcata Road Rehabilitation & Pedestrian/Bikeway Improvements Project. I apologize but am not sure which chapters or sections these three comments belong under because it looks like they could fall under several sections? Overall I support the project and support the proposal, I do want to make sure three areas are addressed. One of my suggestions is not covered as far as I can tell and the other two may be but I cannot tell based on the level of detail in the EIS.

For some context, I live on Anderson Lane and have lived here for 24 years. My wife and I raised two sons who attended Jacoby Creek Elementary school K through 8 from the late 1990's until 2010. We are regular users of the roadway and adjacent areas to walk to the Plaza, walk to the Bayside Post Office, etc. I moved to Arcata in 1981.

1. First and most importantly, we need a three way stop at the intersection of Anderson Lane and Old Arcata Road. We were always nervous about having our children cross that road on the way to or from school due to the blind curve south of the intersection and the speeds at which vehicles travel along Old Arcata Road along there. Over 24 years I have observed school buses, fire trucks not traveling code three, Humboldt County Sheriff's vehicles not traveling code three, and countless other vehicles traveling along that route at high rates of speed, much faster than 25 miles per hour. On any given day, at any give time of day, any observer can stand at that intersection and watch vehicles disregarding the posted speed limit, regardless of signage, speed bumps, etc. On any given morning, you can observe the same vehicle travel to Jacoby Creek School with children in the car speed past the intersection, drop the children off at Jacoby Creek School and then speed back past the intersection traveling north, likewise folks on the way to work, students on the way to Arcata High, etc. A three way stop would make the crosswalk safer, and would slow traffic down along the entire stretch from Jacoby Creek Road to the round-a-bouts in Sunnybrae. It would also be very inexpensive and low maintenance. The neighbors on Anderson Lane will even donate the materials and labor to install the signage and painting to make it happen. Current families who live on or near Anderson Lane have the same concerns about allowing their children to cross Old Arcata Road that we have had for 20 years, mitigation to date has not had any impact and the proposed changes will not have any impact. A three way stop will have a positive impact. 43-1
2. The current sidewalk south from Anderson Lane to the Bayside Post Office is installed at a significant angle, so much so that you sidehill all along it when you are walking or running along it. I'm not sure if it is designed that way or if it has degraded to that point but the new sidewalk should be installed so that it has a much more reasonable angle so that it's more practical for use. 43-2

3. Lastly the sewer access points that vent onto the walkway and into the yards and homes of neighbors are not a good design or need to be maintained/capped/vented in some other way. Again I am nor sure if this is simply a poor design or poor execution but as a regular user of that walkway, I can tell you that having a public sewer vent into/onto school children, neighbors, other users of a public walkway is not adequate. If you need help with a better design I am happy to help with that but the current design doesn't make any sense. 43-3

Thanks for the opportunity to comment and overall I think the improvements are great and the work that has put into them is great.

Len Mayer
[redacted]
Arcata, CA 95521

Letter 43 – Response to Comments

Response to Comment 43-1

Support for the Project and design recommendations specific to the Anderson Lane intersection

This commenter offers support for the Project and provides design recommendations. Please see Master Response 1 regarding statements for or against the project. This comment provides recommendations for safety improvements, including new stop signs, at the intersection of Old Arcata Road and Anderson Lane, where an existing crosswalk will be upgraded. While an all way stop is unlikely at this intersection, the City will consider additional crosswalk enhancements as the design progresses.

Response to Comment 43-2

Walkway slope

The comment provides recommendations on Project design specific to the sidewalk south from Anderson Lane to the Bayside Post Office and requests an improved side slope that is more practicable for use, compared to existing conditions. The cross slope of the walkway will be constructed to a maximum cross slope of 2%.

Response to Comment 43-3

Sewer access points

Any new sanitary sewer cleanouts installed as part of the project will be capped. The project does not include any new sewer vents as the commenter suggests.

Comment Letter 44

From: Jane Minor
To: COM DEV
Cc: Michael Minor
Subject: Old Arcata Road Rehabilitation Draft EIR
Date: Sunday, September 26, 2021 8:06:43 PM

David Loya, Community Development Director
City of Arcata
736 F Street
Arcata, CA 95521

Dear David Loya,

I live at 1750 Old Arcata Road and bike most days and walk several times a week and drive a car there. I want to register my complete support of the old Arcata Road safety corridor including the roundabout. 44-1

Sincerely,

Jane A Minor

[redacted]

Letter 44 – Response to Comments

Response to Comment 44-1

Letter of support

The commenter offers support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

From:	Michael Minor
To:	COM DEV
Cc:	Jane Minor
Subject:	Old Arcata Road Rehabilitation Draft EIR
Date:	Sunday, September 26, 2021 7:59:01 PM

David Loya, Community Development Director
City of Arcata
736 F Street
Arcata, CA 95521

Dear David Loya,

I am a long time resident of Arcata and live in an historic house, 1750 Old Arcata Road. I am directly impacted by the Old Arcata Road Rehabilitation Project and enthusiastically endorse the findings in the Draft EIR. In my opinion the proposed project should be implemented without modification as soon as practical.

I would like to make a few comments and observations which I think are relevant to the project and addressed in the Draft EIR:

1) My wife and I almost daily bike into Arcata and return thus traversing almost the full extent of the project boundary. At times it can be decidedly unsafe due to poor road and bike lane condition, motorists who are exceeding the speed limit, unauthorized parking in bike lanes, and trash bins left totally blocking the lane. Passing through the vicinity of Jacoby Creek School can sometimes leave me thinking that I should not be doing this at my advanced age (79) and realize that there are children subjected to these same unsafe conditions. 45-1

2) I frequently walk along the project boundary, either to the Post Office and back, or towards Arcata to the cross walk at the Northern boundary of the project and back. Many people are doing the same. There is no consistently safe time or pathway to do this. Existing crosswalks are substandard, not marked well, and frequently ignored by motorists.

3) As many people have observed, traffic entering Arcata's 25 mph zone from the South frequently are exceeding the speed limit. I see this on a daily basis, but people are speeding past my house in the other direction too. The proposed traffic circle at Jacoby Creek Road intersection will help immensely and I would expect have the calming effect observed at the Old Arcata Road — Indianola Road roundabout. I think the roundabout in this project is essential. If you have never been passed in the vicinity of Anvick Road while observing the speed limit, then maybe you too are speeding. 45-2

4) Although we would like to think so, the project boundary does not pass through an historic district. Arcata planners tried their best, but the criteria simply are not met to make it so. Thus instead of the mantra "keep Bayside's rural character," we should say and insist that we "keep Bayside as Arcata, and keep Bayside safe." 45-3

Sincerely,

Michael M Minor
[redacted]

Letter 45 – Response to Comments

Response to Comment 45-1

Letter of support

The commenter offers support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Response to Comment 45-2

Benefits of the roundabout

The commenter notes the roundabout will help with the existing speeding problem and states the roundabout is essential. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Response to Comment 45-3

Project boundary does not pass through a historic district

The commenter notes the Project does not overlap a historic district and notes additional emphasis is needed for safety. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Comment Letter 46

CHRIS JOHNSON HAMER
ERIC V. KIRK
JASON J. EADS
JOSHUA KAUFMAN
JEFFREY W. MONSELL

JOHN R. STOKES, III *RETIRED

THOMAS D. ROWE (1948-2011)
JOHN R. STOKES (1917-2001)
DOROTHY L. STEEVES (1926-1996)

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September 27, 2021

City of Arcata
Community Development
FR
SEP 2 2021
Planning
Housing / Economic Development

VIA HAND-DELIVERY

City of Arcata
Attn: Delo Freitas, Senior Planner,
Community Development Department
736 F Street
Arcata, CA 95521

Re: **Comments Concerning Draft EIR for the Old Arcata Road Rehabilitation & Pedestrian/Bikeway Improvements Project** (SCH# 2021010176)

Dear Mr. Freitas and Planning Staff:

On behalf of Bayside Cares, we submit these comments concerning the Draft Environmental Impact Report ("DEIR") prepared by the City of Arcata ("City") for the proposed Old Arcata Road Rehabilitation & Pedestrian/Bikeway Improvements Project ("Project"). We appreciate City staff's consideration of the following comments.

The Project, as described in the DEIR, includes road resurfacing, a paved walkway, sidewalks and curb ramps, crosswalks, speed humps, lighting, signage, a retaining wall, and stormwater drainage and other infrastructure improvement. New pavement would extend into residential and commercial driveways along Old Arcata Road to ensure smooth transition between existing and new pavement elevations. Construction of a new sidewalk along approximately 375 feet of Hyland Street is also included in the project. The Project includes the following components:

46-1

-Repaving along Old Arcata Road and adjacent bike lanes;

-Crosswalks and Speed Humps;

-Improvements near Jacoby Creek Elementary School;

-Jacoby Creek Road Roundabout;

-Landscaping;

-Lighting; and

-Utility improvements.

After careful review of the Draft EIR, Bayside Cares concludes that the environmental review document does not fulfill the fundamental objectives under the California Environmental Quality Act ("CEQA") of informing the public and the decision makers of the significant environmental effects of the Project, avoiding or mitigating those significant impacts to the extent feasible, and exploring a range of feasible alternatives that could avoid the proposed Project's impacts.[1] As explained previously with respect to the abandoned Initial Study / Mitigated Negative Declaration ("IS/MND") for the Project, and reiterated in the comments below, based on our review, we conclude that the Draft EIR does not analyze the impacts from the "whole of the project" as required and attempts to "sweep under the rug" difficult issues concerning traffic safety impacts, impacts to wetlands and obligate biological resources, impacts to historic resources, land use impacts, and cumulative impacts, among other negative effects of the Project, as proposed. Thus, the environmental analysis of the Project conducted pursuant to CEQA remains fundamentally flawed. Accordingly, the Draft EIR must be substantially revised to squarely addresses all of the Project's potentially significant impacts and consider feasible alternatives that could accomplish the project objectives while avoiding significant impacts. 46-1 Cont.

The following substantiated comments and the evidence cited in these comments demonstrate that City decision makers may not approve the Project unless and until an adequate project-level EIR is prepared and is recirculated for public review and comment.

By submitting these comments and otherwise participating in the administrative process for this Project, Bayside Cares intends to protect the quality of the environment in the Bayside area for all local residents, businesses, and visitors in the area, both now and for future generations. By participating in the environmental review process for this Project, our clients

[1] *See, e.g.*, Pub. Resources Code, §§ 21000, 21001; *see also* CEQA Guidelines, § 15002(a); *see also Friends of Mammoth v. Bd. of Supervisors* (1972) 8 Cal.3d 247, 254-256; *Citizens of Goleta Valley v. Bd. of Supervisors* (1990) 52 Cal.3d 553, 564; *Berkeley Keep Jets Over the Bay Com. v. Bd. of Port Comrs.* (2001) 91 Cal.App.4th 1344, 1354 .

seek to enforce important rights affecting a broad public interest.

With this background, Bayside Cares respectfully submit the following comments on the DEIR. We request that planning staff and, ultimately, the Planning Commission and City Council carefully consider these and all other submitted comments on the prior IS/MND and this DEIR before deciding whether to certify the EIR and approve the Project. 46-1 Cont

I. Introduction:

A. Overview of DEIR Deficiencies

As described in more detail below, the DEIR is deficient in the following respects:

- *Piecemeal environmental review*: The DEIR fails to analyze the whole of the project by failing to consider necessary improvements for: (1) the existing storm drain system into which the Project proposes to direct additional runoff water from the roundabout and other impervious surfaces which are part of the Project. The existing storm drain system fails every year, flooding the area beginning at the Southern boundary of the entire Area Potentially Effected ("APE") every year. If additional water is added to this already failing storm drain system, there is a strong probability that the storm drain system will back up, and flood the entire area of the APE. The City has not created a drainage plan or conducted a drainage study of the existing storm drain system or the APE; (2) the potentially substantial adverse effects of the Project on the provision of sewer service to properties in the APE. The DEIR only notes that privately owned sanitary sewer laterals in the APE "may" have to be removed and replaced, without any explanation as to why this may occur, where it will occur, or the potential adverse effects of such replacement or potential adverse effects on the provision of sewer service to properties in the APE; (3)the DEIR mentions there will be "updating" of water service connections and resetting or installation of water meters within the public right of way, without explaining what "updating" will entail, why it necessary, what potentially substantial adverse effects this may have on the provision of water service to properties in the APE; (4) eliminating an undisclosed number of parking places and replacement of some of those 46-2

in undisclosed locations; (5) what provision will be made for bicycle and pedestrian access on Old Arcata Road beyond the APE, and beyond the end of the sidewalk to be constructed as part of the Project in the APE; (6) if there is to be mitigation for the filling of wetlands as part of the Project, if that mitigation will involve the creation of new wetlands in another area, the ratio of new wetlands to be created to wetlands eliminated, and where the new wetlands will be created; (7) what protection measures the City will implement to prevent sight impaired, mobility impaired and children from being hit by motor vehicles at the crosswalks near the roundabout; (8) mitigation of the adverse effects on unmapped wetlands South and Southwest of the roundabout in the APE and other wetlands in the immediately adjacent area; (9) the extent to which the elevation of the roadbed will be increased, and the potentially substantial adverse effects this will have on drainage and access to properties in the APE, and how these effects will be mitigated; and (10) what protective measures the City will take to ensure that historic structures in or near the APE do not suffer damage from vibrations caused by construction and by vehicle impact with speed humps to be installed as part of the Project.

46-2 Cont.

- *Inadequate Project Description*: The DEIR's description of the Project fails to identify important details concerning necessary improvements: (1) details concerning necessary improvements to the existing storm drain system have not been provided, although the existing storm drain system will likely need to be substantially repaired, moved or replaced. The Project will utilize the existing storm drain system, although no inspection of the entire system has been conducted and no drainage study has been conducted of the entire storm drain system, to determine whether the existing system is capable of receiving both the water it already receives and the additional runoff water it will receive by reason of the Project's addition of approximately one mile of impervious surfaces for the entire APE ("APE"), which fails every year, flooding the area immediately South of the APE; (2) the Project will interfere and conflict with existing underground utilities consisting of a gas line, water main, sewer main and storm drain networks, potentially causing substantial adverse effects on residents and owners in the Project Area. No information is given as to what is to be done with respect to the Project's interference with these underground

46-3

utilities, other than to say that privately owned sanitary sewer laterals "may" need to be replaced, and water connections "may" need to be "updated", without indicating which sewer laterals may need to be replaced, why they may need to be replaced, and what the potential adverse effects on the provision of sewer service to properties in the APE will be, including the adverse effects both during and after construction, what the potential adverse effects will be on the provision of water both during and after construction, or what potential adverse effects there will be concerning the provision of gas service to the Project Area, or how any of the foregoing adverse effects will be mitigated; (2) the Project will eliminate a large number of parking places and places habitually and regularly used by the community for parking. The DEIR does not specify how much parking will be eliminated, or how many parking will be replaced, or where; (3) the DEIR does not specify what protective measures will be taken to protect the safety of pedestrians, particularly children, the elderly and those who are mobility, hearing or sight impaired, at the crosswalks in the roundabout, the design speed of the roundabout, the distance required to stop, and whether there is sufficient distance for a vehicle to stop given the design speed of the roundabout; (4) the DEIR does not state that existing wetlands will be filled. However, the plans included with the DEIR show that existing mapped wetlands will be filled. The DEIR does not specify what mitigation will be undertaken as to the filled wetlands; (5) the DEIR does not specify what potential adverse effects the Project will have on the wetlands in the APE and adjacent to the APE to the South and Southwest, which were not mapped or discussed, and how any adverse effects on those wetlands will be mitigated; (6) the DEIR does not specify what protective measures will be taken to protect the safety of bicyclists when they are forced to use the same lane as logging trucks, large equipment, campers, trailers and cars, in the roundabout, as it has no bike lanes; (7) the DEIR does not specify what provision is made to allow residents of the APE to put out their trash cans for pickup without blocking the bike lane; (8) the DEIR does not specify what protective measures will be taken to protect the safety of motorists, bicyclists and pedestrians where power poles interfere with bike lanes and walkway, on both sides of the road, forcing both pedestrians and bicyclists into traffic;; and (9) the DEIR does not specify what the elevation of the finished road grade will be, and

46-3 Cont.

what impact or potentially adverse effects this will have on drainage and access to properties in the APE, or how these adverse effects will be mitigated. 46-3 Cont.

- *Potentially significant unmitigated traffic safety impacts*: The DEIR glosses over potentially significant traffic safety impacts that may be caused by: (1)motor vehicles stopped and idling for long periods of time on Old Arcata Road near the Post Office, Jacoby Creek School, Mistwood Montessori School and other businesses in the APE, and on Jacoby Creek Road near the Community Hall, Mistwood Montessori School and other businesses in the APE, because they have no place to park and they need to drop off or pick up children or otherwise go into schools, businesses or residences in the APE, because the Project eliminates so much parking in the APE; (2) vehicles illegally parking in the traffic lanes and bike lanes on Old Arcata Road and Jacoby Creek Road because they have no place to park because of the Project's elimination of so much parking; (3) danger to pedestrians in the crosswalks near the roundabout where cars do not stop and there are no stop signs, which must be crossed by mobility impaired, sight impaired, hearing impaired, the very young and the very old pedestrians; (4) danger to bicyclists who will be forced to use the same lane as logging trucks, large equipment, campers, trailers and cars, in the roundabout which has no bike lanes; (5) danger to bicyclists and pedestrians from having to walk or bike in the street because local residents are forced to use the sidewalk and bike lane to put out their garbage cans on garbage pickup day, or not have garbage picked up at all; and (6) danger to bicyclists and pedestrians where power poles are located on both sides of Old Arcata Road in the public easement, interfering with bikeways and walkways, and forcing both into traffic. 46-4

- *Potentially significant unmitigated biological resources impacts*: The City's mapping of wetlands is incomplete, and does not include many existing wetlands in the APE, including, but not limited to, those located South and Southwest of the intersection of Old Arcata Road and Jacoby Creek Road, and those outside of but adjacent to the APE and potentially adversely affected by the Project. The plans included with the DEIR show that the Project will fill mapped wetlands on Jacoby Creek Road. No mitigation for this adverse effect on the wetlands is to be made. 46-5

- *Potentially significant unmitigated land use impacts*: The DEIR disregards, without careful factually supported analysis, the Project's substantial inconsistencies with mandatory Humboldt General Plan requirements applicable to wetlands and historic resources, and Arcata General Plan requirements applicable to wetlands and historic resources. The Project also disregards the rural and scenic designations of Jacoby Creek Road and Old Arcata Road, and the General Plan requirement to preserve the scenic and rural character of the area, preserve historic structures, and to protect the scenic roads. 46-6

- *Potentially significant unmitigated impacts on historic resources*: The DEIR omits consideration of a residence at in the APE which is in the National Historic Register, downplays the historic nature of Bayside Corner, omits consideration of 19 residences which were determined to be eligible for inclusion in an historic district in a 1978 survey, omits consideration of 58 dwellings constructed during the period of 1945-1965, the actual Period of Significance for Bayside Corners, which may be eligible for registry in the National Historic Register, fails to evaluate any properties for their significance at the local or state level by reason of their association with events that have made significant contributions to the broad patterns of local or state history and omits consideration of the visual impact of Project on the historic resources in the APE and adjoining areas. In addition, the DEIR fails to consider the potential adverse effects of the Project on the Old School House, which adverse effects include adverse changes to the view of the Old School House and the view from the Old School House, eliminating parking in the adjacent area used by visitors to the building, eliminating vehicular access to the lot on which the building is situated except by means of the driveway, and causing swaths of headlights from Northbound traffic in the roundabout to shine into the windows of the Old School House. The traveled way and traffic is brought closer to the building, potentially increasing the noise level. This applies to the historic Temperance Hall, as well, used as the Mistwood Montessori School. In addition, applicable to all historic structures, the hydraulic pounding and vibrations caused by construction and motor vehicles impacting the speed humps included in the Project have the potential substantial adverse effect of cracking and damaging the historic structures. 46-7

- *Potentially significant unmitigated impacts on scenic resources, including historic buildings, within a state scenic highway;* The Project will completely destroy the historic appearance of the APE, with its many historic buildings, and with roads that are themselves, scenic and historic; 46-8

- *Potentially significant unmitigated impacts on the existing visual character of public view of the site;* The Project will destroy the rural visual character of the site, which is replete with pastureland, farm houses, fields, gardens, and views of the trees and mountains; 46-9

- *The Project's creation of new sources of substantial light or glare which would adversely affect nighttime views in the area:* The Project will cause the headlights of Northbound traffic in the roundabout to shine into the windows of surrounding residences and into the windows of this historic Old School House building and will cause an area where residents can easily see the stars because there is no public lighting, to have substantial light from five overhead street lamps; 46-10

- *Potential cumulatively considerable net increase of pollutants and exposing sensitive receptors to substantial pollutant concentrations:* The Project will cause a large increase in motor vehicles idling in the roadway and releasing exhaust containing pollutants, because the motor vehicles are not able to park in the vicinity of schools, businesses and community gathering places, by reason of the Project's elimination of parking where there is already a severe shortage of necessary parking. School children, who are sensitive receptors, would be exposed to these pollutants[2]; 46-11

- *Potentially substantial adverse effects on protected wetlands through direct removal, filling, hydrological interruption or other means:* The Project will fill and eliminate the wetlands next to Jacoby Creek as mapped by the City. No mitigation of the filling and mitigation of the wetlands is provided. Additional wetlands which the City did not map or identify are located in the APE and 46-12

[2] A Petition by parents, teachers and grandparents of children at Mistwood Montessori School is attached as **Exhibit "A"**.

will be substantially adversely effected by the Project and no mitigation is provided. 46-12 Cont.

- *Potentially cause a substantial adverse change in the significance of historical resources:* the Project omits consideration of the substantial adverse changes the Project will potentially cause to the aesthetic appearance of the historic resources in the APE and adjoining areas, including the 4 historic structures the DEIR identifies, the residence which is on the National Register the DEIR omits, the 19 residences previously identified as eligible for an historic district, and 58 other recognized historic houses and buildings which are potentially eligible for the National or State Historic Registers, as well as Bayside Corners, which is the intersection of Old Arcata Road and Jacoby Creek Road in the APE, which is itself, historic; 46-13

- *Potentially cause an unmitigated adverse change in the significance of an archeological resource:* The Project acknowledges that there are likely to be Native American artifacts in the area but does not propose employing a Tribal monitor during construction or any other concrete methods of mitigating the potential adverse effects on these artifacts when found during construction of the Project; 46-14

- *Potentially, through the addition of impervious surfaces in a manner which would substantially increase the amount of surface runoff in a manner which would result in flooding on or off site*: the Project adds a mile of impervious surfaces, including a roundabout, paved bike lanes and sidewalks, and directs the surface runoff from these surfaces into catch basins and culverts tied to the existing storm drain system, a system which already fails, causing flooding every year in the area adjacent to the APE. If the existing storm drain system receives this additional water, it is likely to backup and flood the APE. 46-15

- *Potentially requiring or resulting in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage facilities, the construction or relocation of which could cause significant environmental effects:* The Project will conflict with the water main, sewer main and gas main, as well as the network of storm drains, according to the 2019 SHN Report commissioned by 46-16

the City.[3] How this conflict is to be resolved and the potential adverse effects of this conflict, or how they will be mitigated, are not provided. The DEIR states only that private sewer laterals "may" have to be replaced and water connections "may" need to be "updated". This means there is an anticipated significant impact on the wastewater treatment systems and provision of water to properties in the APE. The Project states that new catch basins and a new culvert will be connected with the existing storm drain system. The existing storm drain system is not functional as shown by the fact that a the area on the existing system, immediately adjacent to the APE, floods every year. No study appears to have been done to determine whether the existing storm drain system is functional or capable of receiving the additional runoff water to be generated by the mile of impervious surfaces added by the Project.

46-16 Cont.

- *Potentially expose people and structures to significant risks of downstream flooding and drainage changes:* the area immediately South of the APE on the Old Arcata Road already floods, and is on the same storm drain system as the APE. The Project will tie the water from new catch basins and a new culvert to the existing storm drain system, substantially increasing the risk of flooding in the APE as well as adjacent areas, potentially increasing the risk of flooding buildings in the APE, including the historic Temperance Hall.

46-17

- *Potentially contribute to a cumulative significant impact from noise*: The Project moves motor vehicle traffic many feet closer to Jacoby Creek School, Mistwood Montessori School, numerous private residences and businesses, increasing the noise which will be experienced by the occupants, including vulnerable receptors, such as grade school children. The City did not perform a noise study to assess the potential adverse effects from noise in the APE.

46-18

- *Potentially significant unmitigated cumulative impacts*: The cumulative impact analysis is perfunctory and fails to satisfy the requirements of CEQA. The analysis must be revised to consider all relevant past, present, and reasonably foreseeable probable future projects that will cause impacts that can combine with the impacts of this

46-19

[3] 2019 SHN Report, p.25

Project. The conclusory analysis, fails to identify, much less consider, the cumulative impacts caused by numerous past, present, and reasonably probable future projects in the nearby vicinity and the region. The DEIR must also analyze whether the Project's incremental contributions to cumulative impacts, even if not directly or indirectly significant, are cumulatively considerable. 46-19 Cont.

The Planning Commission and City Council should not approve the Project based on this inadequate DEIR. Instead, the City must substantially revise the DEIR before considering the Project for approval.

B. Documents Referenced in the Draft EIR Were Not Made Available for Public Review During the Comment Period, as is Required Under CEQA.

As a preliminary matter, the publics' review of the Draft EIR was hampered by the unavailability of referenced studies supporting the analysis of Project impacts, (including the APE map, showing the APE for historical and cultural resources.) The public was informed these maps were "confidential". However, sensitive information concerning cultural and historical resources could have been redacted so that the remainder of the supporting analysis could be produced to the reviewing public. CEQA requires the lead agency to make available for public review the environmental review document as well as all documents referenced in that document.[4] Under Public Resources Code, section § 21092(b)(1), the Notice of Preparation of an EIR must specify the location of the EIR and "all documents referenced [therein] are available for review." Here, not all documents referenced in the EIR have been made available to the public and reviewing agencies, as required. 46-20

II. The DEIR Fails to Satisfy CEQA's Requirements.

A. Inaccurate Project Description

Under CEQA, an EIR is legally defective if it fails to describe the proposed project accurately. The courts have repeatedly held that "an accurate, stable and finite project description is the *sine qua non* of an informative and legally 46-21

[4] *See Ballona Wetlands Land Trust v. City of Los Angeles* (2011) 201 Cal.App.4th 455 ["The lead agency must notify the public of the draft EIR, make the draft EIR and all documents referenced in it available for public review, and respond to comments that raise significant environmental issues."], citing PRC §§ 21092, 21091(a), (d) and CEQA Guidelines, §§ 15087, 15088.

sufficient [EIR]."[5] The CEQA Guidelines define "project" broadly to encompass the "whole of the action."[6] As the Guidelines state, "the term 'project' has been interpreted to mean far more than the ordinary dictionary definition of the term."[7] Any activity "which may cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment" constitutes a "project" and is necessarily a part of the "whole of the action."[8] This includes, but is not limited to, "later phases of the project, and any secondary, support, or off-site features necessary for its implementation."[9] If later phases or future activities are reasonably foreseeable consequences of a proposed project, an agency must include a description of the actions in the environmental review document and analyze their impacts.[10]

46-21 Cont.

1. Inadequate Disclosure and Description of Necessary Project Components

The DEIR did not disclose or describe a considerable number of Project features. Most notably, the DEIR does not describe, glosses over, and/or downplays:

(1) The fact the existing storm drain system may need to be substantially repaired, moved or replaced. The Project will utilize the existing storm drain system, although no inspection of the entire system has been conducted and no drainage study has been conducted of the entire storm drain system, to determine whether the existing system is capable of receiving both the water it already receives and the additional runoff water it will receive by reason of the Projects addition of approximately one mile of impervious surfaces for the entire Area Potentially Effected ("APE"). The area adjacent to the APE,

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[5] *County of Inyo v. County of Los Angeles* (1977) 71 Cal.App.3d 185, 193.

[6] CEQA Guidelines, §§ 15003(h), 15165, 15378(a).

[7] CEQA Guidelines, § 15002(d).

[8] Pub. Resources Code, § 21065.

[9] CEQA Guidelines, Appendix G [explanation regarding description of project].

[10] *Burbank-Glendale-Pasadena Airport Authority v. Hensler* (1991) 233 Cal.App.3d 577, 592; *Laurel Heights I, supra*, 47 Cal.3d at pp. 396-397 [EIR held inadequate for failure to assess impacts of second phase of pharmacy school's occupancy of a new medical research facility].

on the existing storm drain system, fails every year, flooding the area; 46-21 Cont.

(2) The manner in which the conflict between the Project and underground utilities, including water main, sewer main, gas main and a storm drain network[11], will be resolved, and what adverse effects will be created by this conflict and these resolution measures. The DEIR states only that sewer laterals "may" need to be replaced and water connections "updated"[12]; 46-22

(3) The manner in which the likely conflict between power poles on both sides of the road in the public right of way and bike lanes and walkways will be resolved, without forcing bicyclists and pedestrians into traffic[13]; 46-23

(4) A large number of parking places the Project will eliminate which will not be replaced. If any parking places are to be replaced, it is not specified how many or where; 46-24

(5) How the safety of pedestrians, particularly children, the elderly and those who are mobility, hearing or sight impaired, will be protected at the crosswalks in the roundabout, (*e.g.*, the DEIR does not describe the design speed of the roundabout, the distance required to stop, and whether there is sufficient distance for a vehicle to stop given the design speed of the roundabout)[14]; 46-25

(6) The significant effects the Project will have on the wetlands in the APE and adjacent to the APE at the South, which were not mapped or discussed; 46-26

(7) The mitigation that must be undertaken to compensate for the mapped wetlands eliminated by the Project; 46-27

(8) Protective measures to ensure bicyclists' safety when the roundabout design, which includes no bike lanes, forces cyclists to use the same lane as motor vehicles, including logging trucks, large equipment, recreational vehicles, and vehicles pulling campers or horse trailers. 46-28

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[11] 2019 SHN Report, p.26
[12] DEIR, p. 2-6
[13] 2019 SHN Report, p.26
[14] CalTrans Highway Design Manual, Chapter 200, attached as Exhibit "B-1"; DOT Roundabout Geometric Design Guidance, Federal Report # F/CA/RI-2006/13, attached as Exhibit "B-2".

The DEIR must be revised to accurately describe the "whole of the project" including any necessary modifications to the existing storm water system, to the provision of water to residences and businesses, to the sewer systems of the residences and businesses in the area, including the sewer laterals, the effect of and mitigation of the adverse effect on, both mapped and unmapped wetlands, provisions to ensure the safety of pedestrians at crosswalks in the roundabout, provisions to ensure the safety of bicyclists in the roundabout, all existing parking in every location which the Project will eliminate, including areas currently used for parking motor vehicles which are not designated parking places, exactly how many new parking places will be created and where, and the number, height and brightness of the lights to be installed at or near the roundabout. 46-28 Cont.

2. Inconsistent Descriptions of Impact on Utilities and Drainage.

The DEIR also (1) does not adequately describe the entire drainage plan for the APE, including the existing drainage system it plans to use; (2) the modifications to the provision of water, sewer, gas and the existing stormwater network that will be required because the Project conflicts with the underground water main, sewer main, water main and stormwater network; or (3) provide the finish road grade, and describe what impact this raised elevation of the road will have on drainage and access to properties in the APE. These omissions and discrepancies must be rectified and the analysis revised based on a stable, finite, and accurate project description. 46-29

3. Omitted Information Concerning the Project's Construction Schedule

The DEIR's description of the proposed construction schedule for the Project omits important information.[15] This generalized description does not state how many people will be present at the Project site during this period or the extent to which travel through the APE by motor vehicles, bicycles or pedestrians will be blocked or impeded during construction. 46-30

Water trucks, pickups and flatbed trucks, boom trucks, dump trucks, material delivery trucks and workers' vehicles will

[15] DEIR, p. 2-3.

presumably all be on the site during Project construction.[16] While the DEIR does state that some of this equipment *may* be onsite during the construction period, it does not provide an estimate of the number of trucks that will be onsite and will deliver material to the Project site per day.[17] In addition, the DEIR does not provide information regarding the average number of workers expected to commute to the Project site.[18] The revised environmental review document must specify where vehicles will be parked during both construction and operation so that decision makers and the public can assess the Project's impacts. 46-30 Cont.

The severity of Project impacts to air quality, biological resources, traffic, and cumulative impacts depends in part on the timing and intensity of Project construction activities. Consequently, this information must be provided and reflected in the impact analyses.

B. The DEIR Does Not Fully Disclose and Adequately Mitigate or Avoid Significant Environmental Impacts.

The DEIR does not provide a complete analysis of the Project's significant direct, indirect and cumulative environmental impacts in the impact areas described below. For these reasons, the County should withdraw the DEIR and prepare a draft EIR for the Project or simply deny the permit application.

1. Unanalyzed Traffic and Traffic Safety Impacts 46-31

(a) *A Traffic Impact Analysis is Required.*

Without a traffic impact analysis, it cannot be determined whether this Project is even necessary and thus, whether the "No Project Alternative" is the most appropriate alternative.

Without a traffic impact analysis, it also cannot be determined which of the listed alternative projects is most appropriate for the traffic being experienced in the APE.

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[16] The DEIR does not specify what s equipment that will be used for Project construction. It states what the equipment would include, but says that the equipment would not be limited to this list. DEIR, at 2-7.

[17] *Id.*, at pp. 2-6, 2-7

[18] *Id.*, at pp. 2-6, 2-7, 2-8.

In addition, there are a number of potentially substantial adverse effects on traffic which may be caused by the Project, as set forth in (1)(b), below, none of which have been mentioned or analyzed in the DEIR. 46-31 Cont.

(b) *The Project's Design Poses Traffic Safety Hazards.*

The DEIR concludes, without detailed analysis, that the Project would not substantially increase hazards due to a geometric design feature.[19] However, the analysis does not mention, much less consider, the adjacent location of schools, businesses, and other gathering places and the location of crosswalks in close proximity to the roundabout. 46-32

(c) *Conditions of Approval Do Not Compensate for the Lack of Enforceable and Effective Mitigation Measures*

As discussed above, because of the preexisting shortage of parking in the APE and vicinity, together with the large number of parking places and areas conventionally used for parking which the Project eliminates, it may be reasonably anticipated that motor vehicles will be parked illegally in the travelled way of Old Arcata Road and Jacoby Creek Road or on the bike lanes or sidewalks, and that other motor vehicles may instead remain unmoving, idling their motors, in the travelled way of Old Arcata Road and Jacoby Creek Road while picking up or dropping off children at school, picking up or dropping off adults at businesses or residences, or while the driver is inside a building for an errand. This can be reasonably expected to result in blockage of roads and bicycle lanes, resulting in traffic jams and possible accidents, with moving vehicles colliding with parked vehicles, and pedestrians being injured as they emerge from between cars illegally parked in the travelled way. 46-33

There is no bike lane in the traffic circle so bicycle and motor vehicle will necessarily mix, including large trucks, equipment and logging trucks, endangering the safety of bicyclist.

No provision is made to prevent speeding on the straight stretches of Old Arcata Road and Jacoby Creek Road adjacent to,

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[19] See DEIR, p. 3.11-12 [Impact TR-c analysis]

leading from and leading to the roundabout, which are areas where speeding currently occurs.

No provision is made for the blockage of bike lanes and sidewalks by power poles on both sides of the road, potentially forcing bicyclists and pedestrians into traffic.

No provision is made for parking vehicles so they will not park or idle in the travelled way or bike lanes when needed to enter buildings in the APE, or to pick up or drop off children or other passengers. 46-33 Cont.

Finally, no provision is made to prevent blockage of bike lanes by garbage cans. Garbage day in Bayside is Tuesdays. If the City moves the road bed two feet farther to the east, as proposed, people on that side of the road will have only the bike lane in which to stand their garbage cans. Bicyclists will then be forced to negotiate obstacles in the bike lane, further restricting their movement therein and potentially forcing bicyclists into traffic. The DEIR must be substantially revised to address these traffic safety issues.

2. Unanalyzed Impacts to Public Services

-underground utilities, including the water main, sewer main, gas line and storm drain networks, will conflict with the Project according to the 2019 SHN Report commissioned by the City.[20] The impact of the Project on any of these utilities is not analyzed in the DEIR.

-the DEIR states only that private sewer laterals "may" have to be replaced";

-the DEIR states only that water connections will be "updated"; 46-34

-the APE may be flooded, which may adversely affect the operation of sewage, water and other underground utility systems;

-groundwater quality may be adversely affected by digging and flooding in the area, adversely affecting the quality of water in private wells.

[20] 2019 SHN Report, p.26.

3. Unanalyzed Impacts to Wetlands

The Wetland Delineation Report omits several wetlands in the APE and adjacent to the APE which are potentially adversely affected by the Project, particularly those to the South adjacent to Old Arcata Road. The Project will fill and eliminate the wetlands that are mapped. The DEIR does not specify how this elimination will be mitigated, whether new wetlands will be created, where they will be created, or the ratio of newly created wetlands to wetlands eliminated. 46-35

4. Unanalyzed Air Quality Impacts

The Project eliminates parking places and places conventionally and habitually used for the parking of a large number of vehicles. The expected result of eliminating this parking is a large number of vehicles stopped in the travelled roadway with their engines idling, releasing exhaust containing toxins into the air in the APE. This impact on air quality has not been analyzed. [21] 46-36

5. Disregarded Land Use Impacts

(a) *Inconsistencies with applicable County General Plan Requirements*

The Project, which is partially located within the unincorporated area of Humbold County[22], must comply with the requirements of Humboldt County General Plan.

Contrary to the conclusory analysis presented on pages 3.3-29 of the DEIR, the Project is not consistent with Policy BR-P7, concerning Wetland Identification. Contrary to this mandatory General Plan policy, the City has not determined during the review process the presence of all "wetlands in the vicinity of a proposed project." 46-37

The Project, as reviewed in the DEIR, is also inconsistent with the County General Plan policy CU-P1. This mandatory policy requires the City to identify and assess as to significance all impacts to historic resources and to protect those resources from substantial adverse change. Because the analysis of impacts

[21] See Mistwood Montessori School Petition, Exhibit "A".
[14] *See* DEIR, pp. 2-3, Figure 2-5; *see also Id.*, pp.3-1 – 3-3.

to historic resources is incomplete, this policy has been violated.

The Project's drainage features violate County General Plan policy WR-P11, concerning County facilities management. That policy requires the design of county roads, drainages and other facilities to minimize erosion and volumes of sediment in stormwater flow. The numerous blocked culverts within the Project's footprint are not addressed in the DEIR. 46-37 Cont.

(b) *Inconsistencies with City of Arcata General Plan policies.*

AQ-2C Reduce or minimize the creation of "hot spots" or localized places of concentrated automobile emissions.

The Project will create hot spots of idling motor vehicles, which will idle in the streets, because the Project eliminates many parking places and areas conventionally and habitually used for parking in the APE, which is already an area with a critical shortage of parking.

AQ-2d Eliminate traffic bottlenecks with traffic flow improvements

The Project will create traffic bottlenecks as vehicles stop for pedestrians in the crosswalks in the roundabout. The Project will create traffic bottlenecks as vehicles are idled or parked in the street or on bike lanes because the Project has eliminated many parking places and areas conventionally and habitually used for parking in the APE. 46-38

RC-3b(2) Filling of wetlands shall only be authorized if appropriate mitigation, resulting in "no net loss" in area and value of wetlands, is provided. Mitigation may consist of creating and maintaining a new wetland of equal or greater functional capacity and value than the wetland proposed to be filled.

RC-3j Minimum mitigation requirements for wetland impacts-Policy RC-3-Diking or filling of a wetland that is otherwise in accordance with the policies of this General Plan shall, at a minimum, require the following mitigation measures, monitoring program and funding:

1. A detailed restoration plan, monitoring program, and funding source for each site shall be required as part of the project application….

2. Areas adequate to maintain functional capacity shall be opened to tidal action, or other sources of surface water shall be provided…

3. Mitigation shall, to the maximum extent feasible, be of the same type as the wetland to be filled….

The Project fills in and eliminates mapped wetlands without providing mitigation: the Project does not map or analyze the potential impact on wetlands in the APE and adjacent to the APE to the South, nor does it provide mitigation of any adverse impacts. 46-38 Cont.

D-3 Scenic Routes, Resources, and Landscape Features: Identify and protect scenic routes, resources, and landscape features. Retain natural features, coastal scenic resources, and scenic vistas as important aesthetic components of the built environment and visual and associative links to nature. Minimize impairment and obstructions of scenic view to the minimum necessary to allow reasonable development.

D-3a Designation of coastal scenic highways. The following scenic highways (within the Project Area) are hereby designated: Old Arcata Road from Bayside Cutoff to Crescent Drive

D-3b Designation of non-coastal scenic highways. The following scenic highway (within the Project Area) are hereby designated: Jacoby Creek Road.

The Project violates the Arcata General Plan because it does protect, but instead changes and adversely impacts, both Old Arcata Road and Jacoby Creek Road, which are both specifically designated to be scenic routes.

6. Unrecognized Significant Impacts to Historic Resources

The City artificially limited the boundaries of the APE, so as to exclude a large number of historic structures which are potentially eligible for the National Register or inclusion in the California Register of Historical Resources. 46-39

The DEIR states that 2212 Jacoby Creek Road, 1928 Old Arcata Road and 2297 Jacoby Creek Road were outside the County right of way that are in the APE. This is incorrect. These three historic buildings are actually adjacent to the County right of way, inside the County planning jurisdiction and outside Arcata City limits. The adverse impacts on them should have been evaluated.

The DEIR omits mention of two architecturally unique properties located in the APE, which the City failed to survey or evaluate for National Register eligibility or inclusion in the California Register of Historical Resources: 1666 Old Arcata Road and 1972 Old Arcata Road.[23]

The DEIR also fails to survey, evaluate for National Register eligibility or inclusion in the California Register of Historic Resources, or evaluate the potential adverse impact on approximately 58 post war era structures within the Project Area that date from 1945-1965 (within the Period of Significance.) (SHN 2017 Report.)[24]

46-39 Cont.

The DEIR also fails to survey, evaluate for National Register eligibility or inclusion in the California Register of Historic Resources, or evaluate the potential adverse impacts on, 19 previously identified historic structures determined to be eligible for inclusion in an historic district in a previous 1978 survey.[25]

This omission violates 36 C.F.R. 60.4, 14 CCR 4850, *et seq.*, and Public Resources Code § 5024.1, which require lead agencies to identify, evaluate and protect individual or collective groupings of historic resources.

No structures or roads were evaluated for their significance at the local and State level for association with events that have made a significant contribution to the broad patterns of local history. Most if not all, are associated with the post-war Douglas Fir Logging Boom in Humboldt County. This violates the previously cited law as well.

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[23] See Comments of Kathleen Stanton re Project's Potentially Significant Impacts on Historic Resources, dated September 27, 2021, attached as **Exhibit "C"**.

[24] 2019 SHN Report, Appendix "F", Architectural History Report No. 14557.

[25] See 2019 SHN Report, Appendix "F", Architectural History Report No. 14557.

The true period of significance for the Project Area, known as Bayside, if from 1860 to 1970, not 1875-1925, as stated in the DEIR. This includes Nineteenth Century Pioneer Settlement, through the social and economic transformation between late 1945 and 1970.

The Project will potentially have substantial adverse effects on the historical resources, as it will detrimentally effect the location, setting, feeling and association with the past, in bringing busy roads much closer to the historic structures and placing near these historic structures a modern urban traffic circle with paved bike paths, sidewalks and 5 overhead lights, materially impairing their visual prominence and historic appearance.

In addition, the Project Area is eligible to be designated a Neighborhood Conservation Area by the City of Arcata, which is the equivalent of an historic district, so it is entitled to particular protection. All that remains for this designation is a survey of the individual properties.

46-39 Cont.

Another potentially substantial adverse effect is that hydraulic hammering and vibrations created by construction of the Project, as well as by motor vehicles impacting the traffic humps included in the Project, may cause historic buildings to crack and potentially threaten the structural integrity of historic buildings.

Yet another potentially substantial adverse effect on historical resources is that the flooding of the APE which is likely to result from the addition to the existing storm drain system of runoff from impervious surfaces created by the Project. The flood water in the APE will run, downhill, directly to the sunken foundation and floor of the historic Temperance Hall, now used as Mistwood Montessori School. Its floor and foundations are below grade, and the present slope of the area is downhill--directly to the foundation and floor of the Temperance Hall.

III. Conclusion: The DEIR Must be Substantially Revised Before the City's Decision Makers Can Consider the Project for Approval.

For the foregoing reasons, Bayside Cares concludes that the DEIR must be substantially revised to consider the full gamut of potentially significant impacts, available and feasible mitigation measures, and environmentally superior alternatives

to the Project. On behalf of Bayside Cares, please provide the undersigned with any notices required pursuant to CEQA.

46-39 Cont.

Very truly yours,

Chris Johnson Hamer
Stokes, Hamer, Kirk & Eads, LLP

Jason Holder
Holder Law Group

cc: (Via e-mail only)
Client contacts

Attachments:
Exhibit A: Mistwood Montessori School Petition
Exhibit B-1: Caltrans Design Manual, Chapter 200
Exhibit B-2: DOT Roundabout Geometric Design Guidance
Exhibit C: Comments of Kathleen Stanton dated 9/27/21

EXHIBIT "A"

Bayside Round About Petition

We, the parents and families of Mistwood School DO NOT support the construction of a Roundabout at intersection at Old Arcata Rd. and Jacoby Creek Road. We DO NOT want the Old Arcata Rd. to move 66 feet closer to the school and have a Roundabout 45 feet from the front of the building. As traffic accelerates around and out of the Roundabout it will spew carbon monoxide and other noxious fumes into the air by the school. The children are "Sensitive Receptors" and their health needs to be protected and that's why we support the ALTERNATIVE PLAN for improving the safety of the intersection and our children.

Signed:

SIGNATURE (PRINTED NAME)	TITLE (PARENT/TEACHER/ALUMNI/ OR...)	EMAIL ADDRESS
Rebecca L Nordquist Rebecca L Nordquist	Teacher / Director	[redacted]
Alice Finen Alice Finen	Teacher / Director	
Rob Neely	Parent	
Jennifer Griffin	parent	
Dusty Miller	Parent	
Isaiah O'Donnell	Parent	
Alexa Davis	Parent	
Kate Crain	Teacher/Parent	
Melody Mosolf	Parent	
Vaj Jay (Atty)	Parent	

Bayside Round About Petition

We, the parents and families of Mistwood School DO NOT support the construction of a Roundabout at intersection at Old Arcata Rd. and Jacoby Creek Road. We DO NOT want the Old Arcata Rd. to move 66 feet closer to the school and have a Roundabout 45 feet from the front of the building. As traffic accelerates around and out of the Roundabout it will spew carbon monoxide and other noxious fumes into the air by the school. The children are "Sensitive Receptors" and their health needs to be protected and that's why we support the ALTERNATIVE PLAN for improving the safety of the intersection and our children.

Signed:

SIGNATURE (PRINTED NAME)	TITLE (PARENT/TEACHER/ALUMNI/ OR...)	EMAIL ADDRESS
Kim Nichols	Parent	[redacted]
Jennifer Kasmirski	Parent	
Amber Shelton	Parent	
Naja Tepe	Parent	
LAUREL MINJIRAS	Parent	
Patricia Craig	Grandparent	

EXHIBIT "B1"

CHAPTER 200
GEOMETRIC DESIGN AND STRUCTURE STANDARDS

Topic 201 - Sight Distance

Index 201.1 - General

Sight distance is the continuous length of highway ahead, visible to the highway user. Four types of sight distance are considered herein: passing, stopping, decision, and corner. Passing sight distance is used where use of an opposing lane can provide passing opportunities (see Index 201.2). Stopping sight distance is the minimum sight distance for a given design speed to be provided on multilane highways and on 2-lane roads when passing sight distance is not economically obtainable. Stopping sight distance also is to be provided for all users, including motorists and bicyclists, at all elements of interchanges and intersections at grade, including private road connections (see Topic 504, Index 405.1, & Figure 405.7). Decision sight distance is used at major decision points (see Indexes 201.7 and 504.2). Corner sight distance is used at intersections (see Index 405.1, Figure 405.7, and Figure 504.3I).

Table 201.1 shows the minimum standards for stopping sight distance related to design speed for motorists. Stopping sight distances given in the table are suitable for Class II and Class III bikeways. The stopping sight distances are also applicable to roundabout design on the approach roadway, within the circulatory roadway, and on the exits prior to the pedestrian crossings. Also shown in Table 201.1 are the values for use in providing passing sight distance.

See Chapter 1000 for Class I bikeway sight distance guidance.

Chapter 3 of "A Policy on Geometric Design of Highways and Streets," AASHTO, contains a thorough discussion of the derivation of stopping sight distance.

201.2 Passing Sight Distance

Passing sight distance is the minimum sight distance required for the driver of one vehicle to pass another vehicle safely and comfortably. Passing must be accomplished assuming an oncoming vehicle comes into view and maintains the design speed, without reduction, after the overtaking maneuver is started.

Table 201.1
Sight Distance Standards

Design Speed[1] (mph)	Stopping[2] (ft)	Passing (ft)
10	50	---
15	100	---
20	125	800
25	150	950
30	200	1,100
35	250	1,300
40	300	1,500
45	360	1,650
50	430	1,800
55	500	1,950
60	580	2,100
65	660	2,300
70	750	2,500
75	840	2,600
80	930	2,700

(1) See Topic 101 for selection of design speed.
(2) For sustained downgrades, refer to underlined standard in Index 201.3

The sight distance available for passing at any place is the longest distance at which a driver whose eyes are 3 ½ feet above the pavement surface can see the top of an object 4 ¼ feet high on the road. See Table 201.1 for the calculated values that are associated with various design speeds.

In general, 2-lane highways should be designed to provide for passing where possible, especially those routes with high volumes of trucks or recreational vehicles. Passing should be done on tangent horizontal alignments with constant grades or a slight sag vertical curve. Not only are drivers reluctant to pass on a long crest vertical curve, but it is impracticable to design crest vertical curves to provide for passing sight distance because of high cost where crest cuts are involved. Passing sight

distance for crest vertical curves is 7 to 17 times longer than the stopping sight distance.

Ordinarily, passing sight distance is provided at locations where combinations of alignment and profile do not require the use of crest vertical curves.

Passing sight distance is considered only on 2-lane roads. At critical locations, a stretch of 3- or 4-lane passing section with stopping sight distance is sometimes more economical than two lanes with passing sight distance.

Passing on sag vertical curves can be accomplished both day and night because headlights can be seen through the entire curve.

See Part 3 of the California Manual on Uniform Traffic Control Devices (California MUTCD) for criteria relating to the placement of barrier striping for no-passing zones. Note, that the passing sight distances shown in the California MUTCD are based on traffic operational criteria. Traffic operational criteria are different from the design characteristics used to develop the values provided in Table 201.1 and Chapter 3 of AASHTO, A Policy on Geometric Design of Highways and Streets. The aforementioned table and AASHTO reference are also used to design the vertical profile and horizontal alignment of the highway. Consult the District Traffic Engineer or designee when using the California MUTCD criteria for traffic operating-control needs.

Other means for providing passing opportunities, such as climbing lanes or turnouts, are discussed in Index 204.5. Chapter 3 of AASHTO, A Policy on Geometric Design of Highways and Streets, contains a thorough discussion of the derivation of passing sight distance.

201.3 Stopping Sight Distance

The minimum stopping sight distance is the distance required by the user, traveling at a given speed, to bring the vehicle or bicycle to a stop after an object ½-foot high on the road becomes visible. Stopping sight distance for motorists is measured from the driver's eyes, which are assumed to be 3 ½ feet above the pavement surface, to an object ½-foot high on the road. See Index 1003.1(10) for Class I bikeway stopping sight distance guidance.

The stopping sight distances in Table 201.1 should be increased by 20 percent on sustained downgrades steeper than 3 percent and longer than one mile.

201.4 Stopping Sight Distance at Grade Crests

Figure 201.4 shows graphically the relationships between length of highway crest vertical curve, design speed, and algebraic difference in grades. Any one factor can be determined when the other two are known.

201.5 Stopping Sight Distance at Grade Sags

From the curves in Figure 201.5, the minimum length of vertical curve which provides headlight sight distance in grade sags for a given design speed can be obtained.

If headlight sight distance is not obtainable at grade sags, lighting may be considered. The District approval authority or Project Delivery Coordinator, depending upon the current District Design Delegation Agreement, and the District Traffic Engineer or designee shall be contacted to review proposed grade sag lighting to determine if such use is appropriate.

201.6 Stopping Sight Distance on Horizontal Curves

Where an object off the pavement such as a bridge pier, building, cut slope, or natural growth restricts sight distance, the minimum radius of curvature is determined by the stopping sight distance.

Available stopping sight distance on horizontal curves is obtained from Figure 201.6. It is assumed that the driver's eye is 3 ½ feet above the center of the inside lane (inside with respect to curve) and the object is ½-foot high. The line of sight is assumed to intercept the view obstruction at the midpoint of the sight line and 2 feet above the center of the inside lane when the road profile is flat (i.e. no vertical curve). Crest vertical curves can cause additional reductions in sight distance. The clear distance (m) is measured from the center of the inside lane to the obstruction.

The design objective is to determine the required clear distance from centerline of inside lane to a retaining wall, bridge pier, abutment, cut slope, or other obstruction for a given design speed. Using

radius of curvature and minimum sight distance for that design speed, Figure 201.6 gives the clear distance (*m*) from centerline of inside lane to the obstruction.

See Index 1003.1(13) for bikeway stopping sight distance on horizontal curve guidance.

When the radius of curvature and the clear distance to a fixed obstruction are known, Figure 201.6 also gives the sight distance for these conditions.

See Index 101.1 for technical reductions in design speed caused by partial or momentary horizontal sight distance restrictions. See Index 203.2 for additional comments on glare screens.

Cuts may be widened where vegetation restricting horizontal sight distance is expected to grow on finished slopes. Widening is an economic trade-off that must be evaluated along with other options. See Topic 902 for sight distance requirements on landscape projects.

201.7 Decision Sight Distance

At certain locations, sight distance greater than stopping sight distance is desirable to allow drivers time for decisions without making last minute erratic maneuvers (see Chapter III of AASHTO, A Policy on Geometric Design of Highways and Streets, for a thorough discussion of the derivation of decision sight distance.)

On freeways and expressways the decision sight distance values in Table 201.7 should be used at lane drops and at off-ramp noses to interchanges, branch connections, safety roadside rest areas, vista points, and inspection stations. When determining decision sight distance on horizontal and vertical curves, Figures 201.4, 201.5, and 201.6 can be used. Figure 201.7 is an expanded version of Figure 201.4 and gives the relationship among length of crest vertical curve, design speed, and algebraic difference in grades for much longer vertical curves than Figure 201.4.

Decision sight distance is measured using the 3 ½-foot eye height and ½-foot object height. See Index 504.2 for sight distance at secondary exits on a collector-distributor road.

Table 201.7
Decision Sight Distance

Design Speed (mph)	Decision Sight Distance (ft)
30	450
35	525
40	600
45	675
50	750
55	865
60	990
65	1,050
70	1,105
75	1,180
80	1,260

Topic 202 - Superelevation

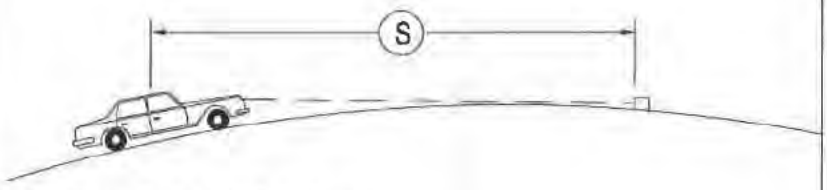
202.1 Basic Criteria

When a vehicle moves in a circular path, it undergoes a centripetal acceleration that acts toward the center of curvature. This force is countered by the perceived centrifugal force experienced by the motorist.

On a superelevated highway, this force is resisted by the vehicle weight component parallel to the superelevated surface and by the side friction developed between the tires and pavement. It is impractical to balance centrifugal force by superelevation alone, because for any given curve radius a certain superelevation rate is exactly correct for only one driving speed. At all other speeds there will be a side thrust either outward or inward, relative to the curve center, which must be offset by side friction.

If the vehicle is not skidding, these forces are in equilibrium as represented by the following simplified curve equation, which is used to design a curve for a comfortable operation at a particular speed:

Figure 201.4
Stopping Sight Distance on Crest Vertical Curves



Drivers eye height is 3 ½ feet.
Object height is ½-foot.

L = Curve Length (feet)

A = Algebraic Grade Difference (%)

S = Sight Distance (feet)

V = Design Speed for "S" in mph

K = Distance in feet required to achieve a 1% change in grade. K value as shown on graph is valid when S < L.

Notes:

- Before using this figure for intersections, branch connections and exits, see Indexes 201.7 and 405.1, and Topic 504.
- See Figure 204.4 for vertical curve formulas.
- See Index 204.4 for minimum length of vertical curve

When S > L	When S < L
$L = 2S - 1329/A$	$L = AS^2/1329$

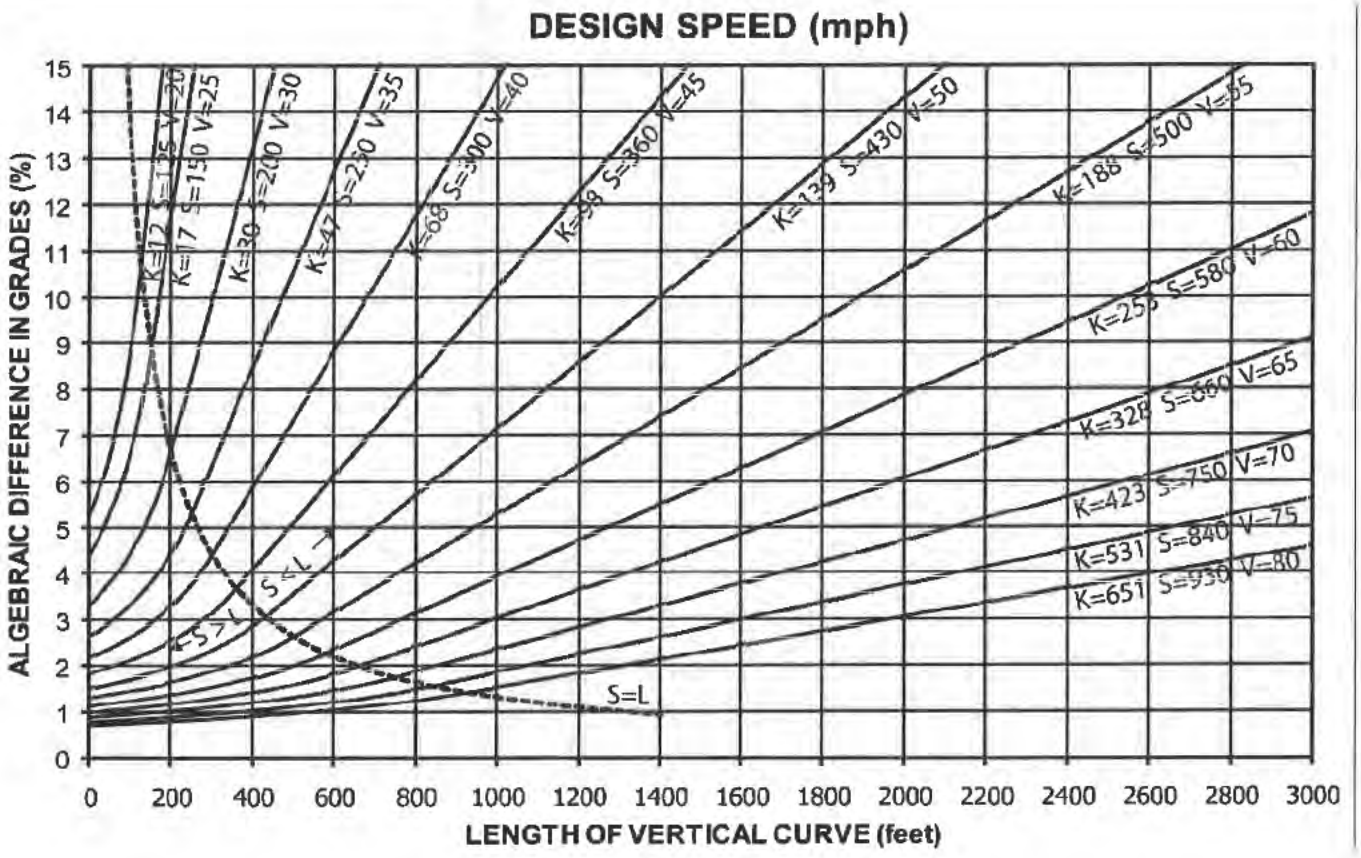
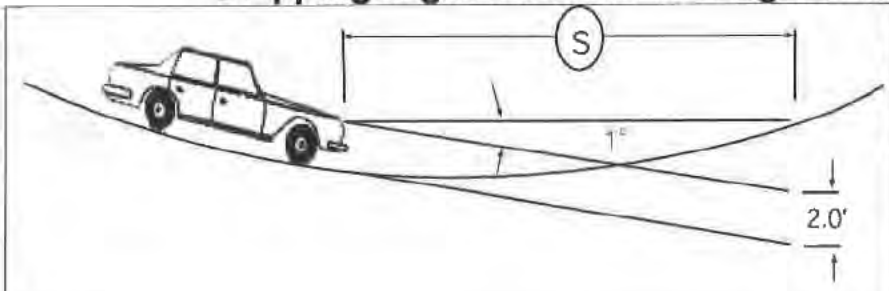


Figure 201.5
Stopping Sight Distance on Sag Vertical Curves



L = Curve Length (feet)
A = Algebraic Grade Difference (%)
S = Sight Distance (feet)
V = Design Speed for "S" in mph
K = Distance in feet required to achieve a 1% change in grade. K value as shown on graph is valid when S < L.

Notes:

- For sustained downgrades, see Index 201.3.
- Before using this figure for intersections, branch connections and exits, see Indexes 201.7 and 405.1, and Topic 504.
- See Figure 204.4 for vertical curve formulas.
- See Index 204.4 for minimum length of vertical curve.

When S > L	When S < L
$L = 2S - (400 + 3.5S)/A$	$L = AS^2/(400 + 3.5S)$

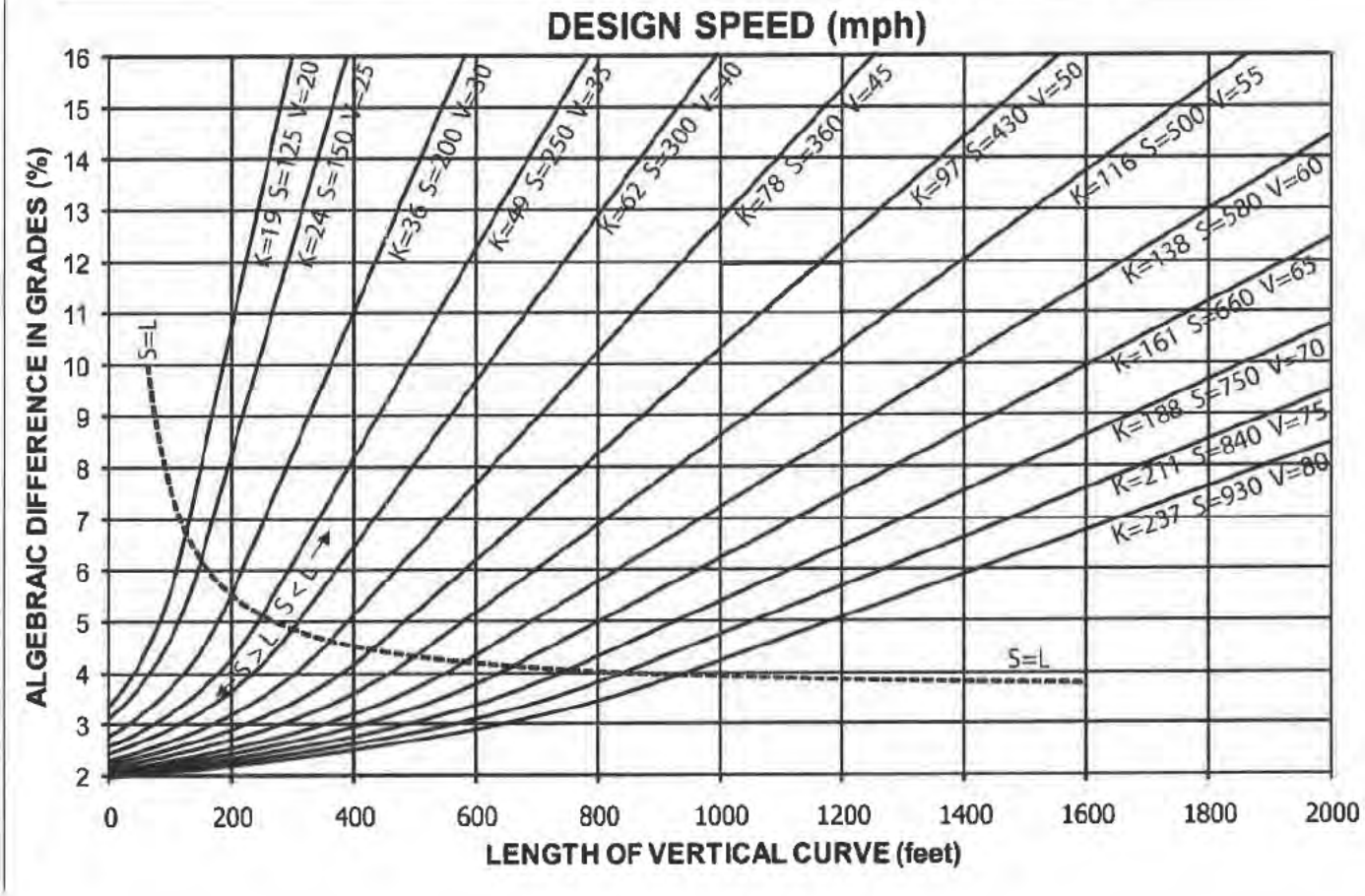
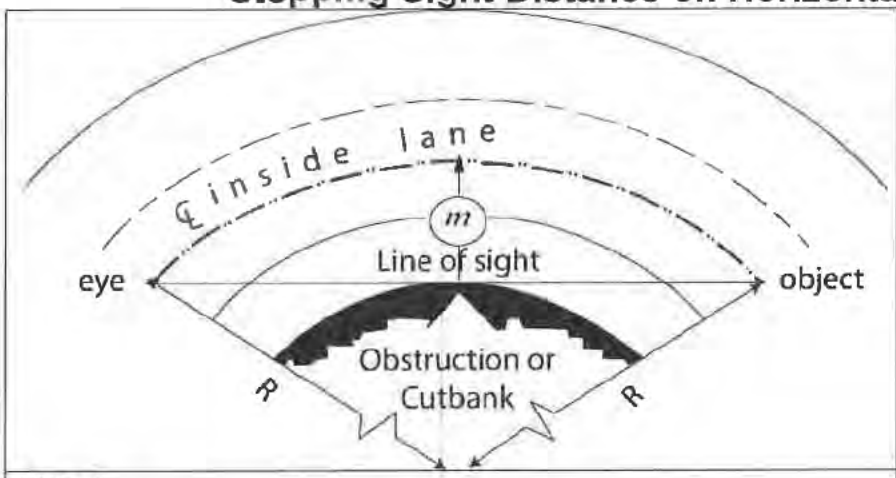


Figure 201.6
Stopping Sight Distance on Horizontal Curves



Line of sight is 2.0 feet above the centerline inside lane at point of obstruction.

R = Radius of the centerline of the lane nearest the obstruction (feet).

S = Sight Distance (feet)

V = Design Speed for "S" in mph

m = Clear distance from centerline of the lane nearest the obstruction (feet).

Notes:

- For sustained downgrades, see Index 201.3.
- Formulas apply only when "S" is equal to or less than length of curve.
- Angles in formulas are expressed in degrees.

$$m = R\left[1 - \cos\left(\frac{28.65S}{R}\right)\right]$$

$$S = \frac{R}{28.65}\left[\cos^{-1}\left(\frac{R - m}{R}\right)\right]$$

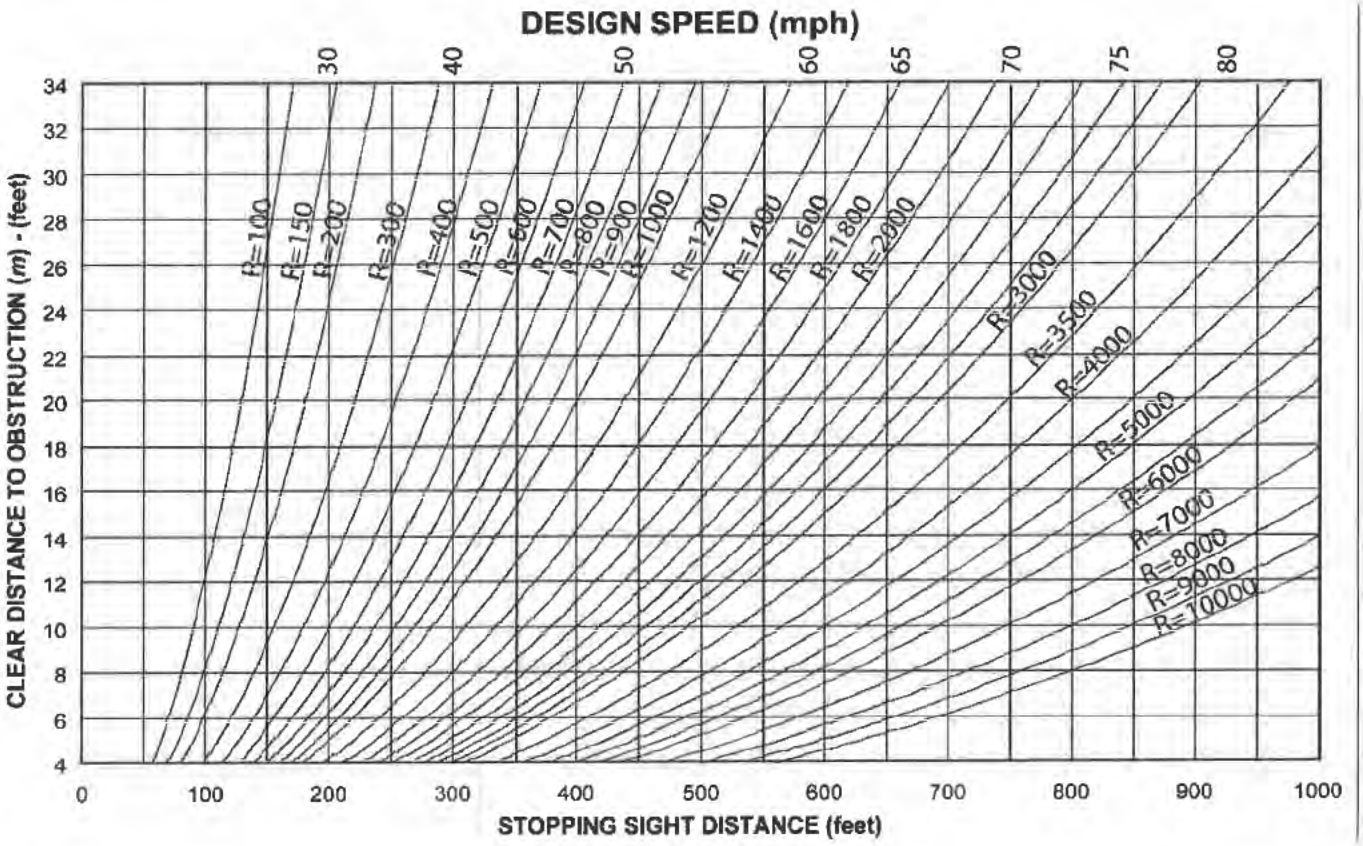
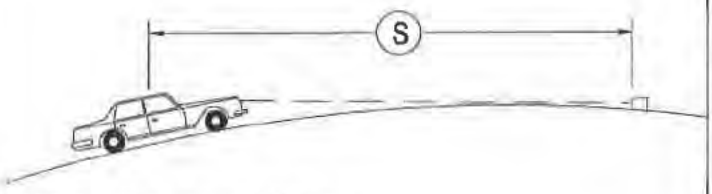


Figure 201.7
Decision Sight Distance on Crest Vertical Curves



Drivers eye height is 3½ feet.
Object height is ½-foot.

L = Curve Length (feet)

A = Algebraic Grade Difference (%)

S = Sight Distance (feet)

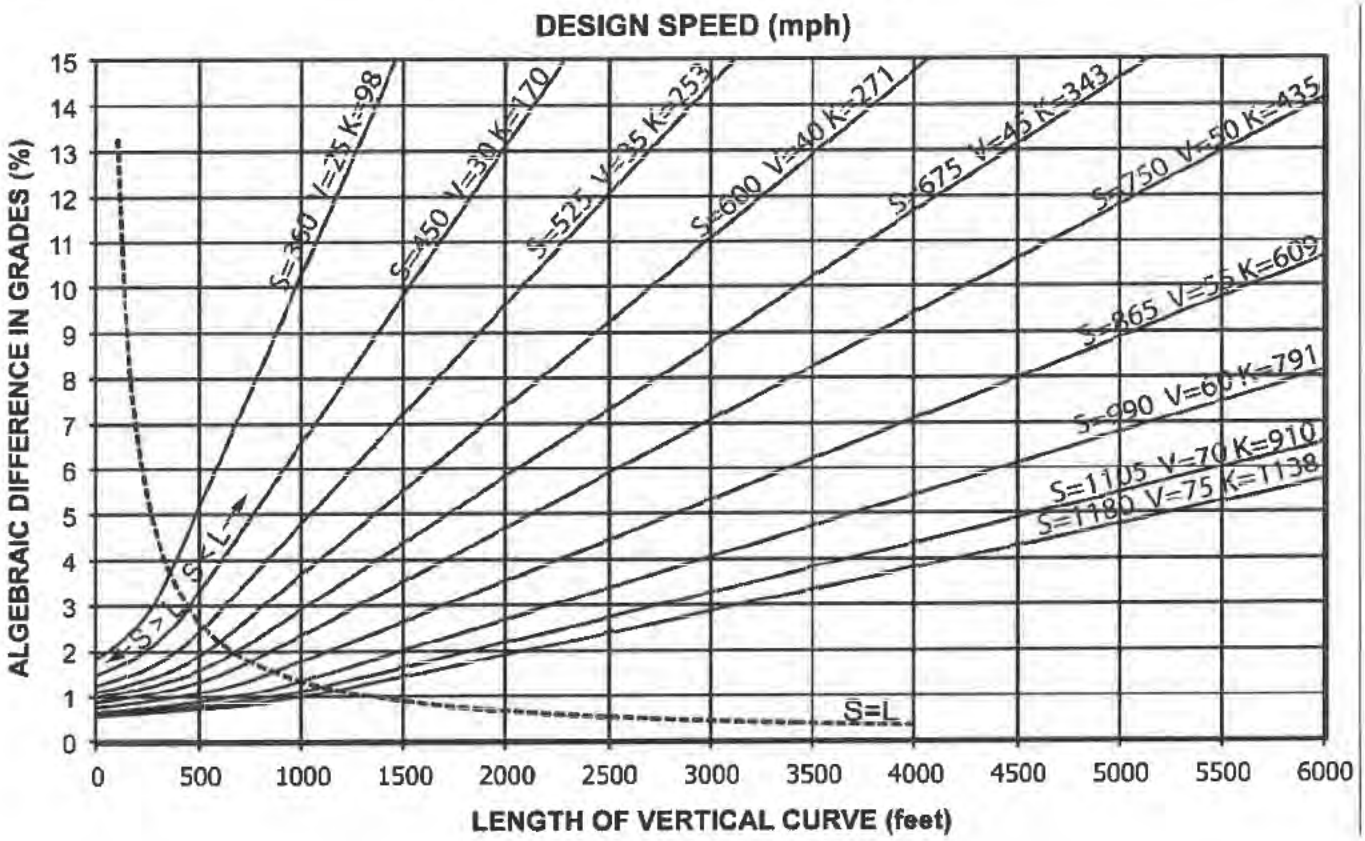
V = Design Speed for "S" in mph

K = Distance in feet required to achieve a 1% change in grade. K value as shown on graph is valid when S < L.

Notes:

- Before using this figure for intersections, branch connections and exits, see Indexes 201.7 and 405.1, and Topic 504.
- See Figure 204.4 for vertical curve formulas.
- See Index 204.4 for minimum length of vertical curve.

When S > L	When S < L
L = 2S – 1329/A	L = AS² /1329



$$e+f = \frac{0.067V^2}{R} = \frac{V^2}{15R}$$

Where:

e = Roadway superelevation slope, feet per foot
f = Side friction factor
R = Curve radius, feet
V = Vehicle speed, miles per hour

Standard superelevation rates are designed to hold the portion of the centrifugal force that must be taken up by tire friction within allowable limits. Friction factors as related to speed are shown on Figure 202.2. The factors apply equally to flexible and rigid pavements.

202.2 Standards for Superelevation

(1) Highways. Maximum superelevation rates for various highway conditions are shown in Tables 202.2A through 202.2E. The maximum rates of superelevation (e_{max}) used on highways are controlled by four factors: climate conditions (i.e., frequency and amount of snow and ice); terrain conditions (i.e., flat, rolling, or mountainous); type of area (i.e., rural or urban); and frequency of slow-moving vehicles whose operations might be affected by high superelevation rates. Consideration of these factors jointly leads to the conclusion that no single maximum superelevation rate is universally applicable.

The highest superelevation rate for highways in common use is 10 percent, although 12 percent is used in some cases. Superelevation rates above 8 percent are only used in areas without snow and ice. Although higher superelevation rates offer an advantage to vehicles at high speeds, current practice considers that rates in excess of 12 percent are beyond practical limits. This practice recognizes the combined effects of construction processes, maintenance difficulties, and operation of vehicles at low speeds.

Where traffic congestion or the clustered land use of developing corridors (i.e., industrial, commercial, and residential) restricts top speeds, it is common practice to utilize a lower maximum rate of superelevation (typically 4 to 6 percent). Similarly, either a low maximum rate of superelevation or no superelevation is employed within intersection areas or where there is a tendency to drive slowly because of turning and crossing movements, warning devices, and signals. In these areas it is difficult to warp crossing pavements for drainage without providing negative superelevation for some turning movements. Therefore, use of Tables 202.2D and 202.2E for urban roads may not apply in these locations.

Roadways described below, (a) through (e), shall be designed with the e_{max} indicated. Design of local roads should generally use (d) and (e).

(a) Use e_{max}=12% for ramps, connectors, 2-lane conventional highways, and frontage roads. See Index 202.7 for frontage roads under other jurisdictions.

(b) Use e_{max}=10% for freeways, expressways, and multilane conventional highways.

(c) Use e_{max}=8% when snow and ice conditions prevail (usually over 3,000 feet elevation).

(d) Use e_{max}=6% for urban roads with design speeds 35 to 45 miles per hour.

(e) Use e_{max}=4% for urban roads with design speeds less than 35 miles per hour.

Based on the above e_{max}, superelevation rates from Tables 202.2A through 202.2E shall be used with the minimum curve radii and design speed (V_d). If the superelevation rate is not a whole number, the superelevation rate may be rounded up to the next whole number. **If less than standard superelevation rates are approved (see Index 82.1), Figure 202.2 shall be used to determine superelevation based on the curve radius and maximum comfortable speed.**

When using Tables 202.2A through 202.2E for a given radius, interpolation is not necessary as the superelevation rate should be determined from a radius equal to, or slightly smaller than, the radius provided in the table. The result is a superelevation rate that is rounded up to the nearest 0.2 of a percent. For example, a 50 mph curve with a maximum superelevation rate of 8 percent and a radius of 1,880 feet should use

the radius of 1,830 feet to obtain a superelevation of 5.4 percent. Also, Tables 202.2A through 202.2E use the following terms as defined:

(1) "normal crown" (NC) designates a traveled way cross section used on curves that are so flat that the elimination of adverse cross slope is not needed, and thus the normal cross slope sections can be used. See Index 301.3 for further guidance.

(2) "remove adverse crown" (RC) designates curves where the adverse cross slope should be eliminated by superelevating the entire roadway at the normal cross slope rate.

Maximum comfortable speed is determined by the formula given on Figure 202.2. It represents the speed on a curve where discomfort caused by centripetal acceleration is evident to a driver. AASHTO, A Policy on Geometric Design of Highways and Streets, states, "In general, studies show that the maximum side friction factors developed between new tires and wet concrete pavements range from about 0.5 at 20 miles per hour to approximately 0.35 at 60 miles per hour. In all cases, the studies show a decrease in friction values as speeds increase.

To use Figure 202.2, the designer must decide on the relative importance among three variables. Normally, when a nonstandard superelevation rate is approved, Figure 202.2 will be entered with the superelevation rate and a desired curve radius. It must then be determined whether the resulting maximum comfortable speed is adequate for the conditions or whether further adjustments to radius and superelevation may be needed.

Except for short radius curves, the standard superelevation rate results in very little side thrust at speeds less than 45 miles per hour. This provides maximum comfort for most drivers.

Superelevation for horizontal curves with radii of 10,000 feet and greater may be deleted in those situations where the combination of a flat grade and a superelevation transition would create undesirable drainage conditions on the pavement.

Superelevated cross slopes on curves extend the full width of the traveled way and shoulders, except that the shoulder slope on the low side should be not less than the minimum shoulder slope used on the tangents (see Index 304.3 for cross slopes under cut widening conditions).

On rural 2-lane roads, superelevation should be on the same plane for the full width of traveled way and shoulders, except on transitions (see Index 304.3 for cut widening conditions).

(2) Bikeways. Superelevation design criteria in Index 202.2(1) also accommodates Class II, III, and IV bikeways. See Index 1003.1 for Class I guidance.

202.3 Restrictive Conditions

Lower superelevation rates than those given in either Table 202.2 or Figure 202.2 may be necessary in areas where restricted speed zones or ramp/street intersections are controlling factors. Other typical locations are short radius curves on ramps near the local road juncture, either at an intersection or where a loop connects with an overcrossing structure. Often, established street grades, curbs, or drainage may prove difficult to alter and/or superelevation transition lengths would be undesirably short.

Such conditions may justify a reduction in the superelevation rate, different rates for each half of the roadbed, or both. In any case, the superelevation rate provided should be appropriate for the conditions allowing for a smooth transition while providing the maximum level of comfort to the driver. Where standard superelevation rates cannot be attained, discussions should be held with the District Design Liaison and/or the Project Delivery Coordinator to determine the proper solution and the necessity of preparing a design standard decision document. In warping street or ramp surface areas for drainage, adverse superelevation should be avoided (see Figure 202.2).

202.4 Axis of Rotation

(1) Undivided Highways. For undivided highways the axis of rotation for superelevation is usually the centerline of the roadbed. However, in special cases such as desert roads where curves are preceded by long relatively level tangents, the plane of superelevation may be rotated about

Table 202.2A

Minimum Radii for Design Superelevation Rates, Design Speeds, and e_{max}=4%

e (%)	V_d (mph)						
	20	25	30	35	40	45	50
	R (ft)						
NC	1410	2050	2830	3730	4770	5930	7220
RC	902	1340	1880	2490	3220	4040	4940
2.2	723	1110	1580	2120	2760	3480	4280
2.4	513	838	1270	1760	2340	2980	3690
2.6	388	650	1000	1420	1930	2490	3130
2.8	308	524	817	1170	1620	2100	2660
3.0	251	433	681	982	1370	1800	2290
3.2	209	363	576	835	1180	1550	1980
3.4	175	307	490	714	1010	1340	1720
3.6	147	259	416	610	865	1150	1480
3.8	122	215	348	512	730	970	1260
4.0	86	154	250	371	533	711	926

Table 202.2B

Minimum Radii for Design Superelevation Rates, Design Speeds, and e_{max}=6%

e (%)	V_d (mph)								
	20	25	30	35	40	45	50	55	60
	R (ft)								
NC	1580	2290	3130	4100	5230	6480	7870	9410	11100
RC	1120	1630	2240	2950	3770	4680	5700	6820	8060
2.2	991	1450	2000	2630	3370	4190	5100	6110	7230
2.4	884	1300	1790	2360	3030	3770	4600	5520	6540
2.6	791	1170	1610	2130	2740	3420	4170	5020	5950
2.8	709	1050	1460	1930	2490	3110	3800	4580	5440
3.0	635	944	1320	1760	2270	2840	3480	4200	4990
3.2	566	850	1200	1600	2080	2600	3200	3860	4600
3.4	498	761	1080	1460	1900	2390	2940	3560	4250
3.6	422	673	972	1320	1740	2190	2710	3290	3940
3.8	358	583	864	1190	1590	2010	2490	3040	3650
4.0	309	511	766	1070	1440	1840	2300	2810	3390
4.2	270	452	684	960	1310	1680	2110	2590	3140
4.4	238	402	615	868	1190	1540	1940	2400	2920
4.6	212	360	555	788	1090	1410	1780	2210	2710
4.8	189	324	502	718	995	1300	1640	2050	2510
5.0	169	292	456	654	911	1190	1510	1890	2330
5.2	152	264	413	595	833	1090	1390	1750	2160
5.4	136	237	373	540	759	995	1280	1610	1990
5.6	121	212	335	487	687	903	1160	1470	1830
5.8	106	186	296	431	611	806	1040	1320	1650
6.0	81	144	231	340	485	643	833	1060	1330

Table 202.2C

Minimum Radii for Design Superelevation Rates, Design Speeds, and e_{max}=8%

e (%)	V_d (mph)													
	15	20	25	30	35	40	45	50	55	60	65	70	75	80
	R (ft)													
NC	932	1640	2370	3240	4260	5410	6710	8150	9720	11500	12900	14500	16100	17800
RC	676	1190	1720	2370	3120	3970	4930	5990	7150	8440	9510	10700	12000	13300
2.2	605	1070	1550	2130	2800	3570	4440	5400	6450	7620	8600	9660	10800	12000
2.4	546	959	1400	1930	2540	3240	4030	4910	5870	6930	7830	8810	9850	11000
2.6	496	872	1280	1760	2320	2960	3690	4490	5370	6350	7180	8090	9050	10100
2.8	453	796	1170	1610	2130	2720	3390	4130	4950	5850	6630	7470	8370	9340
3.0	415	730	1070	1480	1960	2510	3130	3820	4580	5420	6140	6930	7780	8700
3.2	382	672	985	1370	1820	2330	2900	3550	4250	5040	5720	6460	7260	8130
3.4	352	620	911	1270	1690	2170	2700	3300	3970	4700	5350	6050	6800	7620
3.6	324	572	845	1180	1570	2020	2520	3090	3710	4400	5010	5680	6400	7180
3.8	300	530	784	1100	1470	1890	2360	2890	3480	4140	4710	5350	6030	6780
4.0	277	490	729	1030	1370	1770	2220	2720	3270	3890	4450	5050	5710	6420
4.2	255	453	678	955	1280	1660	2080	2560	3080	3670	4200	4780	5410	6090
4.4	235	418	630	893	1200	1560	1960	2410	2910	3470	3980	4540	5140	5800
4.6	215	384	585	834	1130	1470	1850	2280	2750	3290	3770	4310	4890	5530
4.8	193	349	542	779	1060	1390	1750	2160	2610	3120	3590	4100	4670	5280
5.0	172	314	499	727	991	1310	1650	2040	2470	2960	3410	3910	4460	5050
5.2	154	284	457	676	929	1230	1560	1930	2350	2820	3250	3740	4260	4840
5.4	139	258	420	627	870	1160	1480	1830	2230	2680	3110	3570	4090	4640
5.6	126	236	387	582	813	1090	1390	1740	2120	2550	2970	3420	3920	4460
5.8	115	216	358	542	761	1030	1320	1650	2010	2430	2840	3280	3760	4290
6.0	105	199	332	506	713	965	1250	1560	1920	2320	2710	3150	3620	4140
6.2	97	184	308	472	669	909	1180	1480	1820	2210	2600	3020	3480	3990
6.4	89	170	287	442	628	857	1110	1400	1730	2110	2490	2910	3360	3850
6.6	82	157	267	413	590	808	1050	1330	1650	2010	2380	2790	3240	3720
6.8	76	146	248	386	553	761	990	1260	1560	1910	2280	2690	3120	3600
7.0	70	135	231	360	518	716	933	1190	1480	1820	2180	2580	3010	3480
7.2	64	125	214	336	485	672	878	1120	1400	1720	2070	2470	2900	3370
7.4	59	115	198	312	451	628	822	1060	1320	1630	1970	2350	2780	3250
7.6	54	105	182	287	417	583	765	980	1230	1530	1850	2230	2650	3120
7.8	48	94	164	261	380	533	701	901	1140	1410	1720	2090	2500	2970
8.0	38	76	134	214	314	444	587	758	960	1200	1480	1810	2210	2670

Table 202.2D

Minimum Radii for Design Superelevation Rates, Design Speeds, and e_{max}=10%

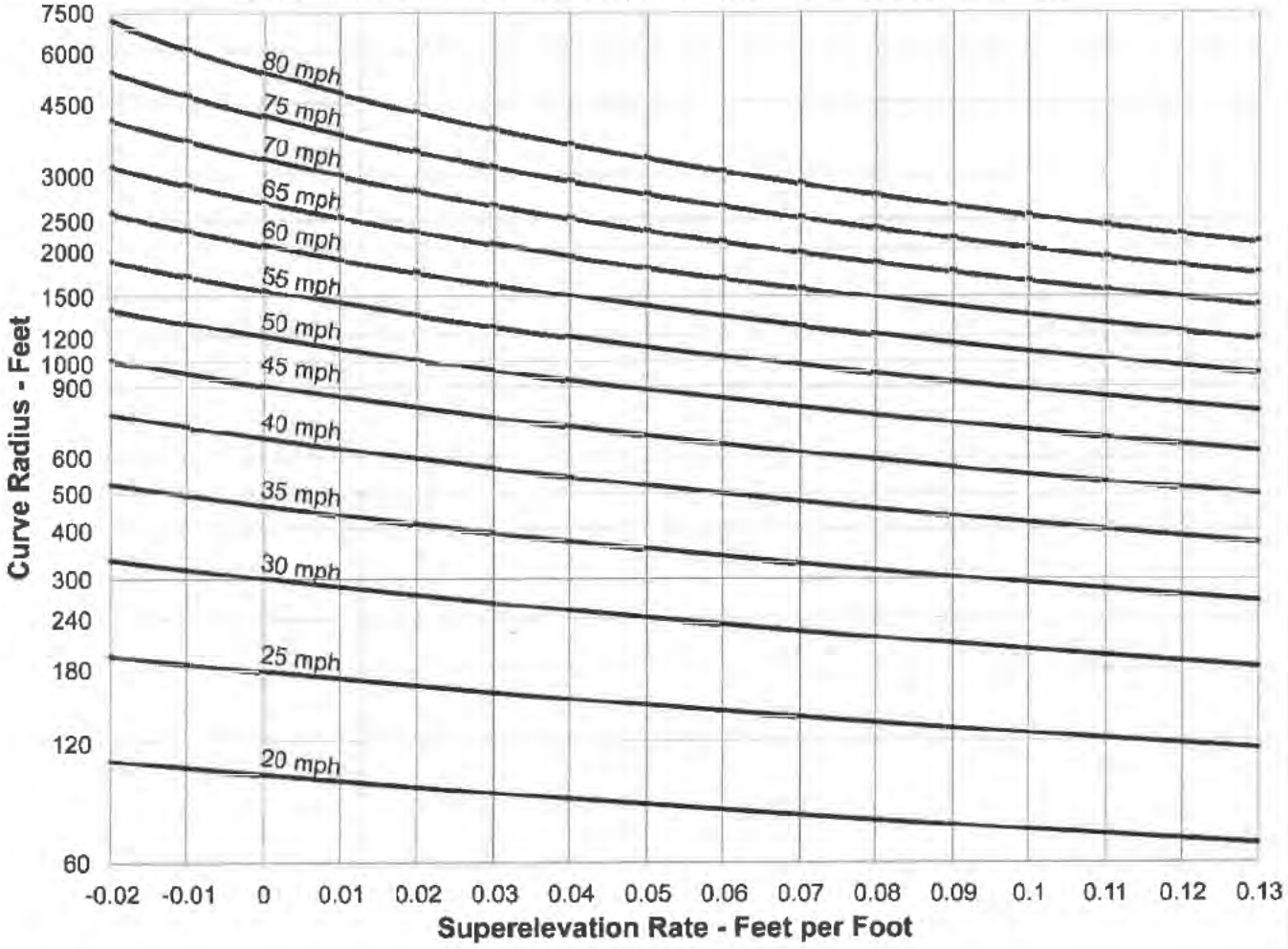
e (%)	V_d (mph)										
	30	35	40	45	50	55	60	65	70	75	80
	R (ft)										
NC	3320	4350	5520	6830	8280	9890	11700	13100	14700	16300	18000
RC	2440	3210	4080	5050	6130	7330	8630	9720	10900	12200	13500
2.2	2200	2900	3680	4570	5540	6630	7810	8800	9860	11000	12200
2.4	2000	2640	3350	4160	5050	6050	7130	8040	9010	10100	11200
2.6	1840	2420	3080	3820	4640	5550	6550	7390	8290	9260	10300
2.8	1690	2230	2840	3520	4280	5130	6050	6840	7680	8580	9550
3.0	1570	2060	2630	3270	3970	4760	5620	6360	7140	7990	8900
3.2	1450	1920	2450	3040	3700	4440	5250	5930	6680	7480	8330
3.4	1360	1790	2290	2850	3470	4160	4910	5560	6260	7020	7830
3.6	1270	1680	2150	2670	3250	3900	4620	5230	5900	6620	7390
3.8	1190	1580	2020	2510	3060	3680	4350	4940	5570	6260	6990
4.0	1120	1490	1900	2370	2890	3470	4110	4670	5270	5930	6630
4.2	1060	1400	1800	2240	2740	3290	3900	4430	5010	5630	6300
4.4	994	1330	1700	2120	2590	3120	3700	4210	4760	5370	6010
4.6	940	1260	1610	2020	2460	2970	3520	4010	4540	5120	5740
4.8	890	1190	1530	1920	2340	2830	3360	3830	4340	4900	5490
5.0	844	1130	1460	1830	2240	2700	3200	3660	4150	4690	5270
5.2	802	1080	1390	1740	2130	2580	3060	3500	3980	4500	5060
5.4	762	1030	1330	1660	2040	2460	2930	3360	3820	4320	4860
5.6	724	974	1270	1590	1950	2360	2810	3220	3670	4160	4680
5.8	689	929	1210	1520	1870	2260	2700	3090	3530	4000	4510
6.0	656	886	1160	1460	1790	2170	2590	2980	3400	3860	4360
6.2	624	846	1110	1400	1720	2090	2490	2870	3280	3730	4210
6.4	594	808	1060	1340	1650	2010	2400	2760	3160	3600	4070
6.6	564	772	1020	1290	1590	1930	2310	2670	3060	3480	3940
6.8	536	737	971	1230	1530	1860	2230	2570	2960	3370	3820
7.0	509	704	931	1190	1470	1790	2150	2490	2860	3270	3710
7.2	483	671	892	1140	1410	1730	2070	2410	2770	3170	3600
7.4	460	641	855	1100	1360	1670	2000	2330	2680	3070	3500
7.6	437	612	820	1050	1310	1610	1940	2250	2600	2990	3400
7.8	416	585	786	1010	1260	1550	1870	2180	2530	2900	3310
8.0	396	558	754	968	1220	1500	1810	2120	2450	2820	3220
8.2	377	533	722	930	1170	1440	1750	2050	2380	2750	3140
8.4	359	509	692	893	1130	1390	1690	1990	2320	2670	3060
8.6	341	486	662	856	1080	1340	1630	1930	2250	2600	2980
8.8	324	463	633	820	1040	1290	1570	1870	2190	2540	2910
9.0	307	440	604	784	992	1240	1520	1810	2130	2470	2840
9.2	291	418	574	748	948	1190	1460	1740	2060	2410	2770
9.4	274	395	545	710	903	1130	1390	1670	1990	2340	2710
9.6	256	370	513	671	854	1080	1320	1600	1910	2260	2640
9.8	236	343	477	625	798	1010	1250	1510	1820	2160	2550
10.0	200	292	410	540	694	877	1090	1340	1630	1970	2370

Table 202.2E

Minimum Radii for Design Superelevation Rates, Design Speeds, and e_{max}=12%

e (%)	V_d (mph)											
	25	30	35	40	45	50	55	60	65	70	75	80
	R (ft)											
NC	2460	3370	4390	5580	6910	8370	9990	11800	13200	14800	16400	18100
RC	1820	2490	3260	4140	5130	6220	7430	8740	9840	11000	12300	13600
2.2	1640	2250	2950	3750	4640	5640	6730	7930	8920	9980	11200	12400
2.4	1500	2060	2690	3420	4240	5150	6150	7240	8160	9130	10200	11300
2.6	1370	1890	2470	3140	3900	4730	5660	6670	7510	8420	9380	10500
2.8	1270	1740	2280	2910	3600	4380	5240	6170	6960	7800	8700	9660
3.0	1170	1620	2120	2700	3350	4070	4870	5740	6480	7270	8110	9010
3.2	1090	1510	1970	2520	3130	3800	4550	5370	6060	6800	7600	8440
3.4	1020	1410	1850	2360	2930	3560	4270	5030	5690	6390	7140	7940
3.6	953	1320	1730	2220	2750	3350	4020	4740	5360	6020	6740	7500
3.8	896	1250	1630	2090	2600	3160	3790	4470	5060	5700	6380	7100
4.0	845	1180	1540	1980	2460	2990	3590	4240	4800	5400	6050	6740
4.2	798	1110	1460	1870	2330	2840	3400	4020	4560	5130	5750	6420
4.4	756	1050	1390	1780	2210	2700	3240	3830	4340	4890	5490	6120
4.6	717	997	1320	1690	2110	2570	3080	3650	4140	4670	5240	5850
4.8	681	948	1260	1610	2010	2450	2940	3480	3960	4470	5020	5610
5.0	648	904	1200	1540	1920	2340	2810	3330	3790	4280	4810	5380
5.2	618	862	1140	1470	1840	2240	2700	3190	3630	4110	4620	5170
5.4	589	824	1090	1410	1760	2150	2590	3060	3490	3950	4440	4980
5.6	563	788	1050	1350	1690	2060	2480	2940	3360	3800	4280	4800
5.8	538	754	1000	1300	1620	1980	2390	2830	3230	3660	4130	4630
6.0	514	723	960	1250	1560	1910	2300	2730	3110	3530	3990	4470
6.2	492	694	922	1200	1500	1840	2210	2630	3010	3410	3850	4330
6.4	471	666	886	1150	1440	1770	2140	2540	2900	3300	3730	4190
6.6	452	639	852	1110	1390	1710	2060	2450	2810	3190	3610	4060
6.8	433	615	820	1070	1340	1650	1990	2370	2720	3090	3500	3940
7.0	415	591	790	1030	1300	1590	1930	2290	2630	3000	3400	3820
7.2	398	568	762	994	1250	1540	1860	2220	2550	2910	3300	3720
7.4	382	547	734	960	1210	1490	1810	2150	2470	2820	3200	3610
7.6	366	527	708	928	1170	1440	1750	2090	2400	2740	3120	3520
7.8	351	507	684	897	1130	1400	1700	2020	2330	2670	3030	3430
8.0	336	488	660	868	1100	1360	1650	1970	2270	2600	2950	3340
8.2	321	470	637	840	1070	1320	1600	1910	2210	2530	2880	3260
8.4	307	452	615	813	1030	1280	1550	1860	2150	2460	2800	3180
8.6	294	435	594	787	997	1240	1510	1810	2090	2400	2740	3100
8.8	281	418	574	762	967	1200	1470	1760	2040	2340	2670	3030
9.0	270	403	554	738	938	1170	1430	1710	1980	2280	2610	2960
9.2	259	388	535	715	910	1140	1390	1660	1940	2230	2550	2890
9.4	248	373	516	693	883	1100	1350	1620	1890	2180	2490	2830
9.6	238	359	499	671	857	1070	1310	1580	1840	2130	2440	2770
9.8	228	346	481	650	832	1040	1280	1540	1800	2080	2380	2710
10.0	219	333	465	629	806	1010	1250	1500	1760	2030	2330	2660
10.2	210	320	448	608	781	980	1210	1460	1720	1990	2280	2600
10.4	201	308	432	588	757	951	1180	1430	1680	1940	2240	2550
10.6	192	296	416	568	732	922	1140	1390	1640	1900	2190	2500
10.8	184	284	400	548	707	892	1110	1350	1600	1860	2150	2460
11.0	175	272	384	527	682	862	1070	1310	1560	1820	2110	2410
11.2	167	259	368	506	656	831	1040	1270	1510	1780	2070	2370
11.4	158	247	351	485	629	799	995	1220	1470	1730	2020	2320
11.6	149	233	333	461	600	763	953	1170	1410	1680	1970	2280
11.8	139	218	312	434	566	722	904	1120	1350	1620	1910	2230
12.0	119	188	272	381	500	641	807	1000	1220	1480	1790	2130

Figure 202.2
Maximum Comfortable Speed on Horizontal Curves*



NOTES:

* See Index 202.2(1) for application of this figure.

Speed (mph)	Side Friction Factor "f"
20	0.27
30	0.20
40	0.16
50	0.14
55	0.13
60	0.12
65	0.11
70	0.10
75	0.09
80	0.08

NOTES:
This figure is not intended to represent standard superelevation rates or curve radius. The standards are contained in Tables 202.2A through 202.2E. This figure should be used as an aid to designers to determine maximum comfortable speeds. Use of this figure in lieu of the standards must be documented as discussed in Index 82.2.

e = Superelevation (feet per foot)
f = Side Friction Factor
V = Speed (mph)
R = Radius (feet)

$$e+f=\frac{0.067V^2}{R}$$

the inside edge of traveled way to improve perception of the curve. In flat country, drainage pockets caused by superelevation may be avoided by changing the axis of rotation from the centerline to the inside edge of traveled way.

(2) *Ramps and Freeway-to-freeway Connections.* The axis of rotation may be about either edge of traveled way or centerline if multilane. Appearance and drainage considerations should always be taken into account in selection of the axis of rotation.

(3) *Divided Highways.*

(a) Freeways--Where the initial median width is 65 feet or less, the axis of rotation should be at the centerline.

Where the initial median width is greater than 65 feet and the ultimate median width is 65 feet or less, the axis of rotation should be at the centerline, except where the resulting initial median slope would be steeper than 10:1. In the latter case, the axis of rotation should be at the ultimate median edges of traveled way.

Where the ultimate median width is greater than 65 feet, the axis of rotation should normally be at the ultimate median edges of traveled way.

To avoid sawtooth on bridges with decked medians, the axis of rotation, if not already on centerline, should be shifted to the centerline.

(b) Conventional Highways--The axis of rotation should be considered on an individual project basis and the most appropriate case for the conditions should be selected.

Aesthetics, grade distortion, superelevation transitions, drainage, and driver perception should be considered when selecting the axis of rotation (see Index 204.2).

202.5 Superelevation Transition

(1) *General.* The superelevation transition generally consists of the crown runoff and the superelevation runoff as shown on Figure 202.5A and 202.5B.

A superelevation transition should be designed in accordance with the diagram and tabular data shown in Figure 202.5A to satisfy the requirements of safety, comfort and pleasing appearance. The length of superelevation transition should be based upon the combination of superelevation rate and width of rotated plane in accordance with the tabulated superelevation runoff lengths on the bottom of Figure 202.5A.

Edge of traveled way and shoulder profiles should be plotted and irregularities resulting from interactions between the superelevation transition and vertical alignment of the roadway should be eliminated by introducing smooth curves. Edge of traveled way and shoulder profiles also will reveal flat areas which are undesirable from a drainage standpoint and should be avoided.

(2) *Runoff.* Two-thirds of the superelevation runoff should be on the tangent and one-third within the curve. This results in two-thirds of the full superelevation rate at the beginning or ending of a curve. This may be altered as required to adjust for flat spots or unsightly sags and humps, or when conforming to existing roadway.

(3) *Restrictive Situations.* In restrictive situations, such as on two lane highways in mountainous terrain, interchange ramps, collector roads, frontage roads, etc., where curve radius and length and tangents between curves are short, standard superelevation rates and/or transitions may not be attainable. In such situations the highest possible superelevation rate(s) and transition length should be used, but the rate of change of cross slope should not exceed 6 percent per 100 feet.

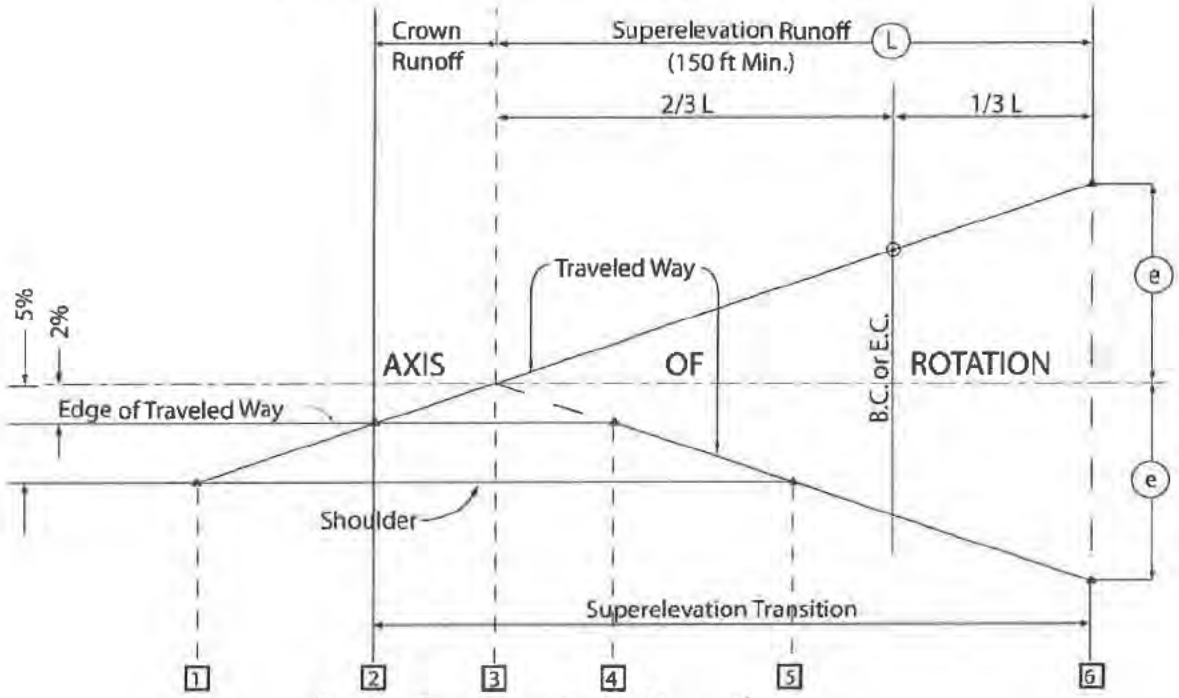
(4) *Superelevation Transitions on Bridges.* Superelevation transitions on bridges should be avoided whenever possible (See Index 203.9).

(5) *Shoulder Transitions.* The shoulder plane rotates about the adjacent edge of traveled way as well as the rotational axis of the traveled way. Shoulder superelevation transitions should be smooth and compatible with the transition of the adjacent pavements.

Figure 202.5A
Superelevation Transition

Formulas		Explanation of Terms
2-Lane Roads	L = 2500 e	(L) = Length of Superelevation Runoff - ft
Multilane Roads & Branch Connections	L = 150 De	(e) = Superelevation rate - ft/ft
Ramps		(D) = Distance from axis of rotation to outside edge of lanes - ft
Multilane	L = 2500 e If possible	
Single Lane	L = 2000 e	
MINIMUM L = 150 FT		MAXIMUM L = 510 FT

Adjust computed length to nearest 10 ft. length divisible by 3

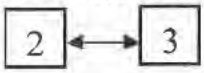
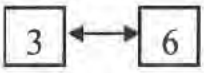


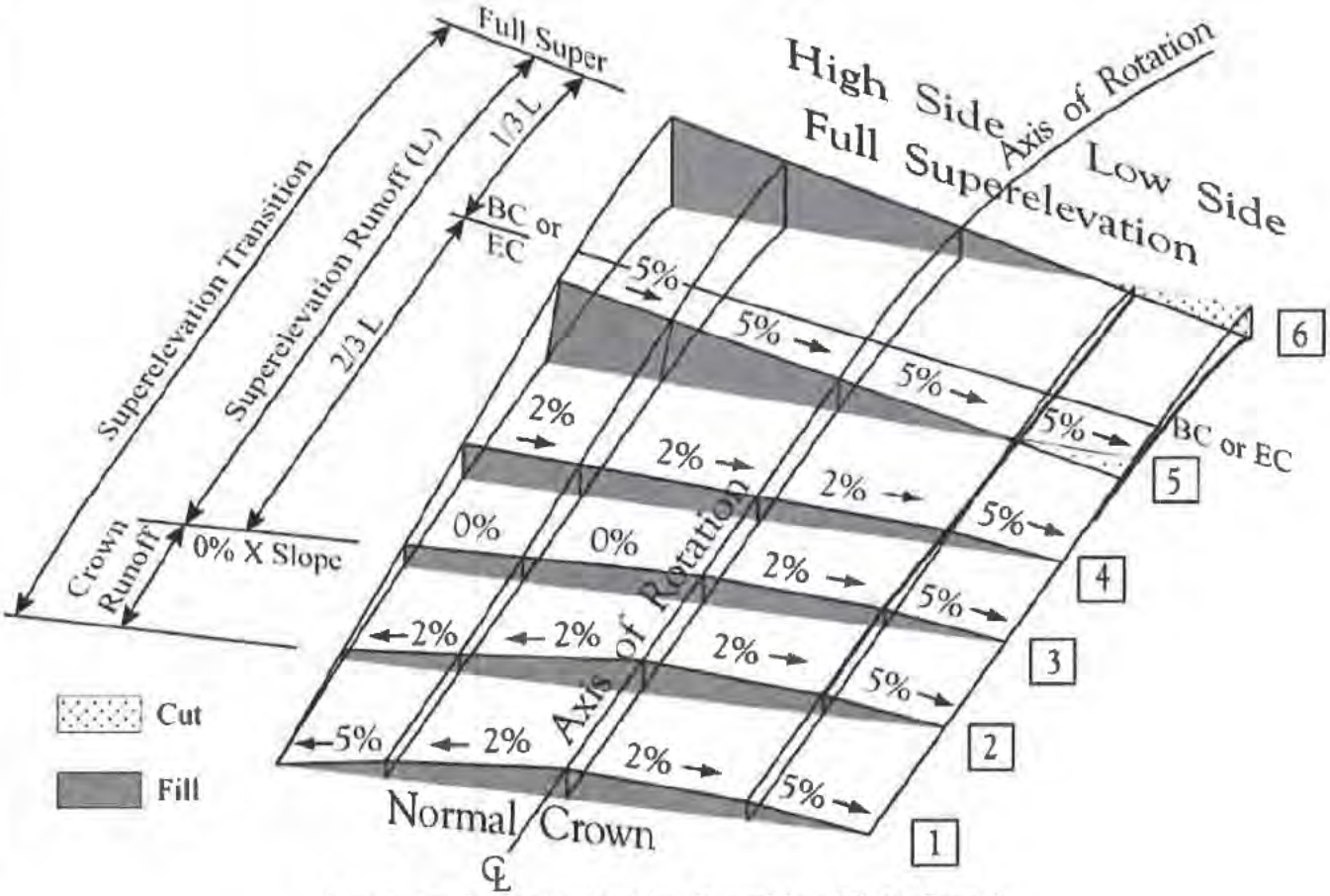
Superelevation Runoff Lengths

Superelevation Rate "e" ft/ft	Length, L (feet)								
	2-Lane Highways & Multilane Ramps	Single Lane Ramps	Multilane Highways and Branch Connections with Various "D" Widths						
			24 ft	36 ft	48 ft	51 ft	60 ft	63 ft	75 ft
0.02	150	150	150	150	150	150	180	180	240
0.03	150	150	150	180	210	240	270	270	330
0.04	150	150	150	210	300	300	360	390	450
0.05	150	150	180	270	360	390	450	480	510
0.06	150	150	210	330	450	450	510	510	
0.07	180	150	270	390	510	510			
0.08	210	150	300	450					
0.09	240	180	330	480					
0.10	240	210	360	510					
0.11	270	210	390						
0.12	300	240	420						

For widths of "D" not included in table, use formula above.

Figure 202.5B
Superelevation Transition Terms & Definitions

Term	Definition
Crown Runoff 	The distance from the station where the high side of the superelevating section surfaces are at a cross slope of 2% to where the high side of the section surfaces reaches a cross slope of 0%.
Superelevation Runoff (L) 	The distance from the station where the high side of the superelevating section surfaces are at a cross slope of 0% to the station where the entire cross section is at full superelevation.
Superelevation Transition 	The distance from the station where the high side of the superelevating sections are crowned at a cross slope of 2% to the station where the entire cross section is at full superelevation. The Crown Runoff Length plus the Superelevation Runoff Length (L) equals the Superelevation Transition Length.
%L On tangent	The percentage of the superelevation runoff length (L) that is outside of the curve (2/3L). See Index 202.5(2).
%L On curve	The percentage of the superelevation runoff length (L) that is within the curve (1/3L). See Index 202.5(2). The % On Tangent and % On curve values must total 100%.



Elements of a Superelevation Transition (Right Curve)

202.6 Superelevation of Compound Curves

Superelevation of compound curves should follow the procedure as shown in Figure 202.6. Where feasible, the criteria in Index 202.5 should apply.

202.7 Superelevation on City Streets and County Roads

Superelevation rates of local streets and roads which are within the State right of way (with or without connection to State facilities) shall conform to AASHTO standards, for the functional classification of the facility in question. If the local agency having jurisdiction over the local facility in question maintains standards that exceed AASHTO standards, then the local agency standards should prevail.

See Index 202.2 for Frontage Roads within the State right of way. Frontage roads that will be relinquished after construction should follow AASHTO or local standards as stated above.

Topic 203 - Horizontal Alignment

203.1 General Controls

Horizontal alignment should provide for safe and continuous operation at a uniform design speed for substantial lengths of highway. The standards which follow apply to curvature on both 2-lane and multilane highways except when otherwise noted. These standards also apply to portions of local streets and roads within the State right of way which connect directly to a freeway or expressway, or are expected to do so in the foreseeable future. **For local facilities which are within the State right of way and where there is no connection or the connection is to a non-controlled access facility (conventional highway), AASHTO standards shall prevail.** If the local agency having jurisdiction over the local facility in question maintains standards that exceed AASHTO standards, then the local agency standards should prevail.

The major considerations in horizontal alignment design are safety, profile, type of facility, design speed, geotechnical features, topography, right of way cost and construction cost. In design, safety is always considered, either directly or indirectly. On freeways in metropolitan areas, alternative studies often indicate that right of way considerations influence alignment more than any other single factor. Topography controls both curve radius and design speed to a large extent. The design speed, in turn, controls sight distance, but sight distance must be considered concurrently with topography because it often demands a larger radius than the design speed. All these factors must be balanced to produce an alignment which optimizes the achievement of various objectives such as safety, cost, harmony with the natural contour of the land, and at the same time adequate for the design classification of the highway.

Horizontal alignment shall provide at least the minimum stopping sight distance for the chosen design speed at all points on the highway, as given in Table 201.1 and explained in Index 201.3. See Index 101.1 for technical reductions in design speed.

203.2 Standards for Curvature

Tables 202.2A through 202.2E shall be the minimum radius of curve for superelevation rates and design speeds on highways. These tables are based upon the relationship between design speed and curvature and on their joint relationship with superelevation and side friction. Though these relationships originate from the laws of mechanics, the actual values for use in design depend on practical limits and factors determined empirically. **If the minimum radii indicated in Tables 202.2A through 202.2E do not provide the desired lateral clearance to an obstruction, Figure 201.6 shall govern.**

See Index 202.2(1) for further information regarding the use of the tables.

Every effort should be made to exceed minimum radii values for the e_{max} of the table being used. Such minimum radii should be used only when the cost or other adverse effects of realizing a higher standard are inconsistent with the benefits. Use of Figure 202.2, in lieu of the above standards must be documented as discussed in Index 82.2.

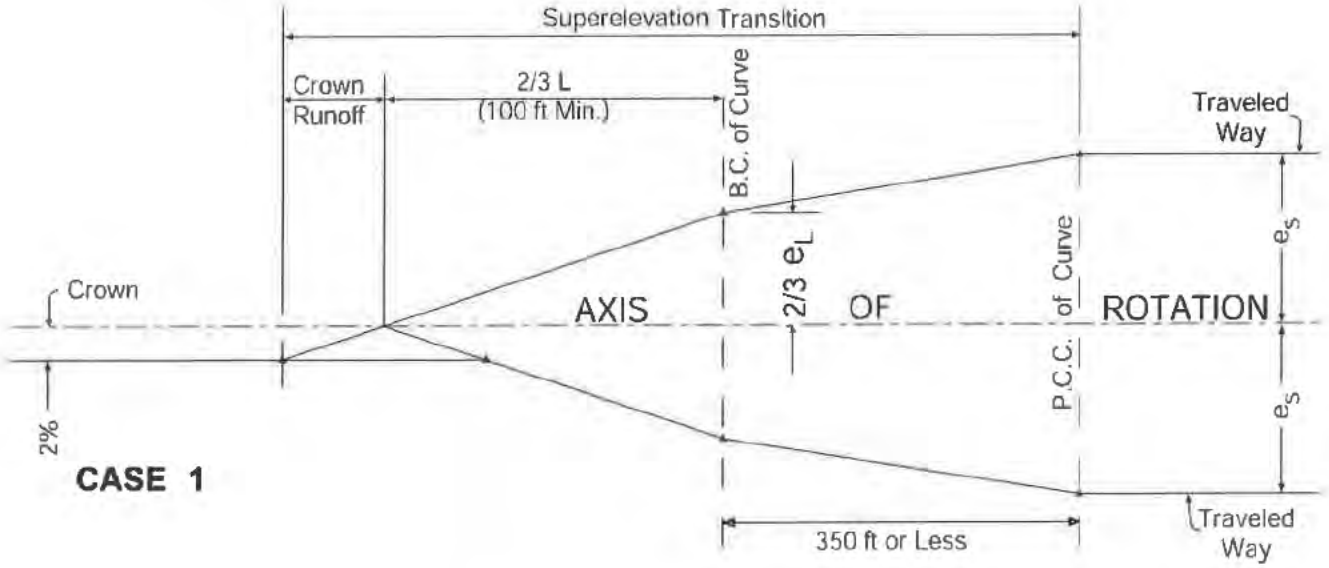
The recommended minimum radii for freeways are 5,000 feet in rural areas and 3,000 feet in urban areas.

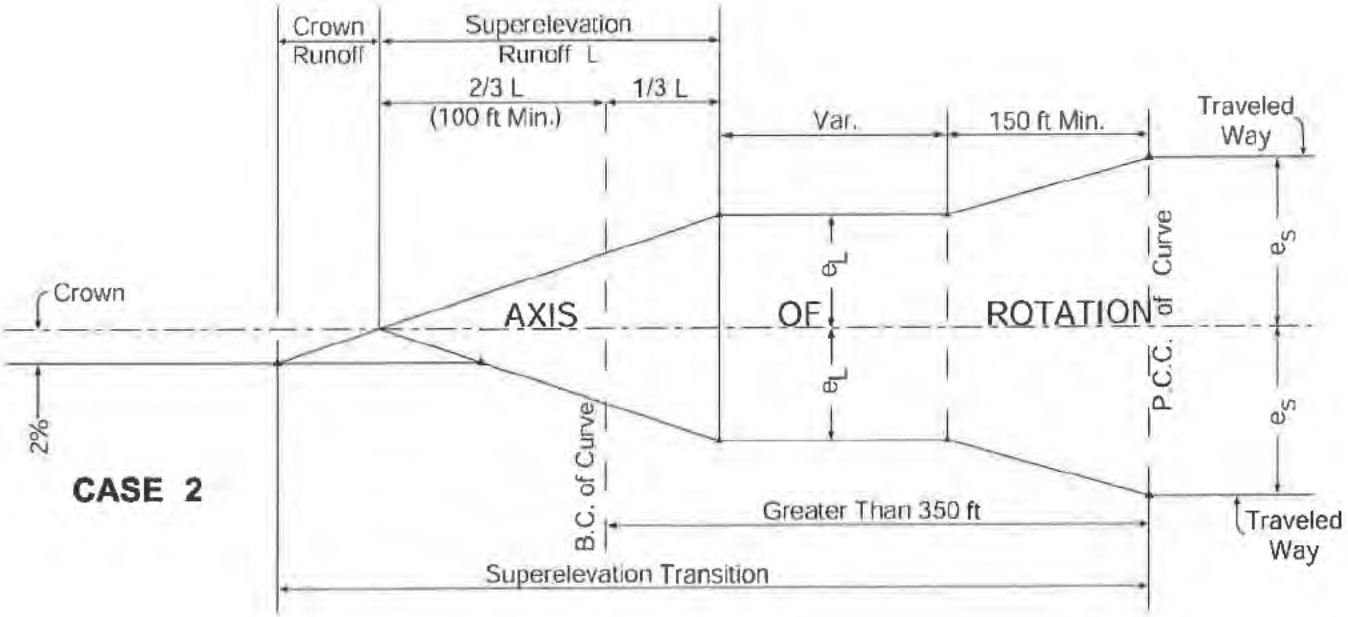
If a glare screen or a median barrier is contemplated, either initially or ultimately, adjustments may be necessary to maintain the required sight distance on curves on divided highways. In such cases, a larger curve radius or a wider median may be required throughout the length of the curve. For design purposes, a planting screen is presumed to be 8 feet

Figure 202.6

Superelevation of Compound Curves

L = Length of superelevation runoff - ft
e_S = Superelevation rate for smaller radius curve - ft/ft or percent
e_L = Superelevation rate for larger radius curves - ft/ft or percent





wide. See Traffic Safety Systems Guidance for glare screen criteria.

203.3 Alignment Consistency

Sudden reductions in alignment standards should be avoided. Where physical restrictions on curve radius cannot be overcome and it becomes necessary to introduce curvature of lower standard than the design speed for the project, the design speed between successive curves should change not more than 10 miles per hour. Introduction of curves with lower design speeds should be avoided at the end of long tangents, steep downgrades, or at other locations where high approach speeds may be anticipated.

The horizontal and vertical alignments should be coordinated such that horizontal curves are not hidden behind crest vertical curves. Sharp horizontal curves should not follow long tangents because some drivers tend to develop higher speeds on the tangent and could over drive the curve.

See "Combination of Horizontal and Vertical Alignment" in Chapter 3 of AASHTO, A Policy on Geometric Design of Highways and Streets, for further guidance on alignment consistency.

203.4 Curve Length and Central Angle

The minimum curve length for central angles less than 10 degrees should be 800 feet to avoid the appearance of a kink. For central angles larger than 30 minutes, a curve is required without exception. Above a 20,000-foot radius, a parabolic curve may be used. Sight distance or other safety considerations are not to be sacrificed to meet the above requirements.

On 2-lane roads a curve should not exceed a length of one-half mile and should be no shorter than 500 feet.

203.5 Compound Curves

Compound curves should be avoided because drivers who have adjusted to the first curve could over drive the second curve if the second curve has a smaller radius than the first. Exceptions can occur in mountainous terrain or other situations where use of a simple curve would result in excessive cost. Where compound curves are necessary, the shorter radius should be at least two-thirds the longer radius when the shorter radius is 1,000 feet or less. On one-way roads, the larger radius should follow the smaller radius.

The total arc length of a compound curve should be not less than 500 feet.

203.6 Reversing Curves

When horizontal curves reverse direction the connecting tangents should be long enough to accommodate the standard superelevation runoffs given on Figure 202.5A. If this is not possible, the 6 percent per 100 feet rate of change should govern (see Index 202.5(3)). When feasible, a minimum of 400 feet of tangent should be considered.

203.7 Broken Back Curves

A broken back curve consists of two curves in the same direction joined by a short tangent. Broken back curves are unsightly and undesirable.

203.8 Spiral Transition

Spiral transitions are used to transition from a tangent alignment to a circular curve and between circular curves of unequal radius. Spiral transitions may be used whenever the traffic lane width is less than 12 feet, the posted speed is greater than 45 miles per hour, and the superelevation rate exceeds 8 percent. The length of spiral should be the same as the Superelevation Runoff Length shown in Figure 202.5A. In the typical design, full superelevation occurs where the spiral curve meets the circular curve, with crown runoff being handled per Figure 202.5A. For a general discussion of spiral transitions see AASHTO *A Policy on the Geometric Design of Streets and Highways*. When used, spirals transitions should conform to the Clothoid definition.

203.9 Alignment at Bridges

Due to the difficulty in constructing bridges with superelevation rates greater than 10 percent, the curve radii on bridges should be designed to accommodate superelevation rates of 10 percent or less. See Index 202.2 for standard superelevation rates.

Superelevation transitions on bridges are difficult to construct and almost always result in an unsightly appearance of the bridge and the bridge railing. Therefore, if possible, horizontal curves should begin and end a sufficient distance from the bridge so that

no part of the superelevation transition extends onto the bridge.

Alignment and safety considerations, however, are paramount and must not be sacrificed to meet the above criteria.

Topic 204 - Grade

204.1 General Controls

The grade line is a reference line by which the elevation of the pavement and other features of the highway are established. It is controlled mainly by topography, type of highway, horizontal alignment, performance of heavy vehicles, right of way costs, safety, sight distance, construction costs, cultural development, drainage, and pleasing appearance.

All portions of the grade line must meet sight distance requirements for the design speed classification of the road.

In flat terrain, the elevation of the grade line is often controlled by drainage considerations. In rolling terrain, some undulation in the grade line is often advantageous for construction economy. This should be done with appearance in mind; for example, a grade line on tangent alignment exhibiting a series of humps visible for some distance ahead should be avoided whenever possible. In rolling hills or mountainous terrain, however, the grade line usually is more closely dependent upon physical controls.

In considering alternative profiles, economic comparisons involving earthwork quantities and/or retaining walls should be made. A balanced earthwork design is most cost effective. When long or steep grades are involved, economic comparisons should include vehicle operating costs.

The standards in Topic 204 also apply to portions of local streets and roads within the State right of way which connect directly to a freeway or expressway, or are expected to do so in the foreseeable future. **For local facilities which are within the State right of way and where there is no connection or the connection is to a non-controlled access facility (conventional highway), AASHTO standards shall prevail.** If the local agency having jurisdiction over the local facility in question maintains standards that exceed AASHTO standards, then the local agency standards should prevail.

204.2 Position With Respect to Cross Section

The grade line should generally coincide with the axis of rotation for superelevation (see Index 202.4). Its relation to the cross section should be as follows:

(1) Undivided Highways. The grade line should coincide with the highway centerline.

(2) Ramps and Freeway-to-freeway Connections. Although the grade line is usually positioned at the left edge of traveled way, either edge of traveled way or centerline may be used on multilane facilities.

(3) Divided Highways. The grade line should be positioned at the centerline of the median for paved medians 65 feet wide or less, thus avoiding a "saw tooth" section, which can reduce horizontal stopping sight distance.

The grade line may be positioned at the ultimate median edge of traveled way when:

(a) The median edges of traveled way of the two roadways are at equal elevation.

(b) The two roadways are at different elevations as described in Index 204.8.

(c) The width of median is nonuniform (see Index 305.6).

204.3 Standards for Grade

Table 204.3 shows the maximum grades which shall not be exceeded for the condition indicated.

Steep grades affect truck speeds and overall capacity. They also cause operational problems at intersections. For these reasons it is desirable to provide the flattest grades practicable (see Index 204.5 for information on truck issues with grades).

Table 204.3

Maximum Grades for Type of Highway and Terrain Conditions

Type of Terrain	Freeways and Expressways	Rural Highways	Urban Highways
Level	3%	4%	6%
Rolling	4%	5%	7%
Mountainous	6%	7%	9%

Minimum grades should be 0.5 percent in snow country and 0.3 percent at other locations. Except for conventional highways in urban or suburban areas, a level grade line is permissible in level terrain where side fill slopes are 4:1 or flatter and dikes are not needed to carry water in the roadbed. Flat grades are not permissible in superelevation transitions due to flat spots which cause ponding on the roadbed.

Ramp grades should not exceed 8 percent. On descending on-ramps and ascending off-ramps, one percent steeper is allowed (see Index 504.2(5)).

204.4 Vertical Curves

Properly designed vertical curves should provide adequate sight distance, safety, comfortable driving, good drainage, and pleasing appearance.

A parabolic vertical curve is used. Figure 204.4 gives all necessary mathematical relations for computing a vertical curve, either at crests or sags. For algebraic grade differences of 2 percent and greater, and design speeds equal to or greater than 40 miles per hour, the minimum length of vertical curve in feet should be equal to 10V, where V = design speed. As an example, a 65 miles per hour design speed would require a 650-foot minimum vertical curve length. For algebraic grade differences of less than 2 percent, or design speeds less than 40 miles per hour, the vertical curve length should be a minimum of 200 feet. Vertical curves are not required where the algebraic difference in grades is 0.5 percent or less. Grade breaks should not be closer together than 50 feet and a total of all grade breaks within 200 feet should not exceed 0.5 percent.

Since flat vertical curves may develop poor drainage at the level section, adjusting the gutter grade or shortening the vertical curve may overcome any drainage problems.

On 2-lane roads, extremely long crest vertical curves, over one-half mile, should be avoided, since many drivers refuse to pass on such curves despite adequate sight distance. It is sometimes more economical to construct passing lanes than to obtain passing sight distance by the use of a long vertical curve.

Broken-back vertical curves consist of two vertical curves in the same direction separated by a short grade tangent. A profile with such curvature normally should be avoided, particularly in sags where the view of both curves is not pleasing.

204.5 Sustained Grades

(1) *General.* Maximum grade is not a complete design control. The length of an uphill grade is important as well, because it affects capacity, level of service, and delay when slow moving trucks, buses, and recreational vehicles are present.

A common criterion for all types of highways is to consider the addition of a climbing lane where the running speed of trucks falls 10 miles per hour or more below the running speed of remaining traffic. Figure 204.5 shows the speed reduction curves for a 200 lb/hp truck, which is representative of large trucks operating near maximum gross weight. The 10 miles per hour reduction criterion may be used as one method of determining need, however the Highway Capacity Manual should be consulted for detailed analysis.

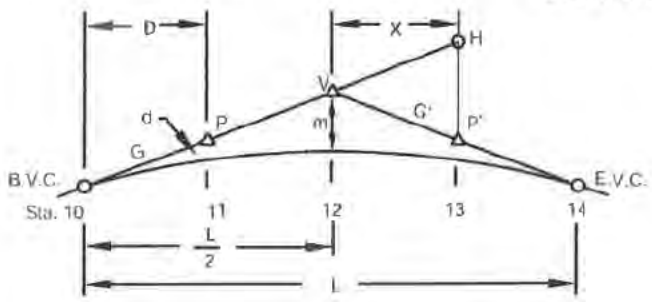
(2) *Freeway Climbing Lanes.* If design year traffic volumes are expected to be near capacity, right of way acquisition and grading for a future lane should be considered at locations where the upgrade exceeds 2 percent and the total rise exceeds 50 feet.

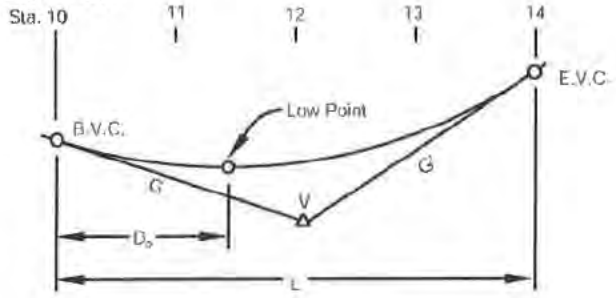
Regardless of traffic volumes, the need for a climbing lane should be investigated on sustained upgrades greater than 2 percent if the total rise is greater than 250 feet. Refer to the Highway Capacity Manual for passenger car equivalent factors and sample calculations.

Decision sight distance (Table 201.7) should be provided at climbing lane drops on freeways.

(3) *Two-lane Road Climbing and Passing Lanes.* Climbing and passing lanes are most effective on uphill grades and curving alignment where the speed differential among vehicles is significant. Climbing and passing lanes should normally not be constructed on tangent sections where the length of tangent equals or exceeds the passing sight distance, because passing will occur at such locations without a passing lane and the double barrier stripe increases delay for opposing traffic. Where the ADT exceeds 5000, 4-lane passing sections may be considered. See Index 305.1(2) for median width standards.

Figure 204.4
Vertical Curves





IN ANY VERTICAL CURVE:

(1) $m = \frac{(G'-G)L}{8}$

(2) $m = \frac{1}{2}\left(\frac{El.B.V.C.+El.E.V.C.}{2} - El.V\right)$

(3) $d = m\left(\frac{D}{L/2}\right)^2 = \frac{4m}{L^2}D^2$

(4) $d = \frac{D^2(G'-G)}{2L} = \frac{-50D^2}{K}$

(5) $X = \frac{100(H-P')}{(G'-G)}$

(6) $S = G - D\left(\frac{G-G'}{L}\right) = G - \frac{100D}{K}$

(7) $D_o = \frac{LG}{G-G'}$

(8) $A = G - G'$

(9) $K = \frac{L}{A}(100) = \frac{L}{G-G'}(100)$

WHERE:

L = Length of curve - measured horizontally - 100 ft. units or stations

G and G' = Grade rates - percent.

m = Middle ordinate - feet.

d = Correction from grade line to curve - feet.

D = Distance from B.V.C. or E.V.C. to any point on curve - stations.

S = Slope of the tangent to the curve at any point - percent.

X = Distance, from P' to V - feet.

H = Elevation of grade G projected to station of P'

P and P' = Elevation on respective grades.

D_o = Distance to low or high point from extremity of curve - stations.

K = Distance in feet required to achieve a 1% change in grade.

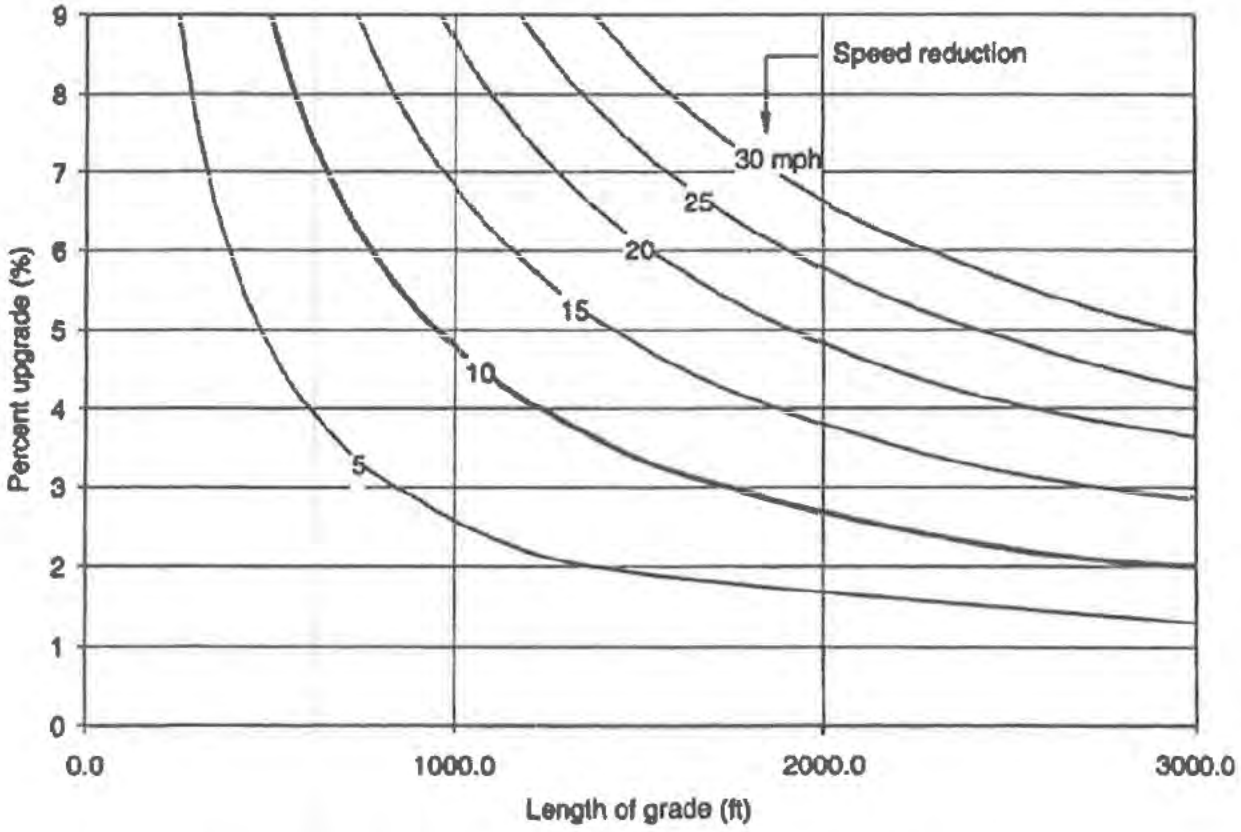
NOTES:

A rising grade carries a plus sign, while a falling grade carries a minus sign.

Thus, in a crest vertical curve as above, G carries a plus sign and G' carries a minus sign when progressing in the direction of the stationing. When progessing in the opposite direction, G becomes a minus grade and G' a plus grade.

Figure 204.5

Critical Lengths of Grade for Design



ASSUMED TYPICAL HEAVY TRUCK OF 200 lb/hp

The Headquarters Division of Traffic Operations should be consulted regarding the length of climbing and passing lanes, which will vary with the design speed of the highway, the traffic volume, and other factors.

(4) *Turnouts*

(a) *General.* On a two-lane highway where passing is limited, the California Vehicle Code requires slow-moving vehicles followed by five or more vehicles to turn off at designated turnouts or wherever sufficient area for a safe turnout exists. Designated turnouts may be constructed in hilly or mountainous terrain or on winding roads in other areas.

Where less than 4-foot shoulders are provided on ascending grades, consideration should be given to providing several short sections of 4 feet or wider shoulder as turnouts for bicycle passing. Frequent turnouts that are at least 30 feet in length are recommended on sustained uphill grades. These turnouts will allow safe passing of bicycles by other bicyclists and vehicles in addition to providing resting opportunities on the sustained grade for bicyclists.

(b) *Length.* Designated turnouts should be from 200 feet to 500 feet long including a short taper (usually 50 feet) at each end. Approach speeds, grades, traffic volumes, and available space are some factors to be considered in determining the length. The District Traffic Engineer or designee should be consulted if longer turnouts are desired.

(c) *Width.* Paved widths of at least 15 feet in fill sections and 12 feet in cut sections are recommended. Width is measured from the edge of traveled way. On the outside of curves along steep fill slopes or dropoffs, greater width or the installation of guardrail should be considered.

(d) *Location.* Turnouts should be located where there is stopping sight distance for approaching drivers to see vehicles leaving and re-entering the through lanes.

204.6 Coordination of Horizontal and Vertical Alignment

A proper balance between curvature and grades should be sought. When possible, vertical curves should be superimposed on horizontal curves. This reduces the number of sight restrictions on the project, makes changes in profile less apparent, particularly in rolling country, and results in a pleasing appearance. Where the change in horizontal alignment at a grade summit is moderate, a pleasing appearance may be attained by making the vertical curve overlap the horizontal curve.

When horizontal and vertical curves are superimposed, the combination of superelevation and profile grades may cause distortion in the outer pavement edges which could create drainage concerns or confuse drivers at night. In such situations edge of pavement profiles should be plotted and smooth curves introduced to eliminate any irregularities or distortion.

On highways in mountainous or rolling terrain where horizontal and vertical curves are superimposed at a grade summit or sag, the design speed of the horizontal curve should be at least equal to that of the crest or sag, and not more than 10 miles per hour less than the measured or estimated running (85^{th} percentile) speed of vehicles on the approach roadway.

On long open curves, a uniform grade line should be used because a rolling profile makes for a poor appearance.

Horizontal and vertical curvature at intersections should be as flat as physical conditions permit.

See "Combination of Horizontal and Vertical Alignment" in Chapter III of AASHTO, A Policy on Geometric Design of Highways and Streets, for further guidance on a alignment consistency.

204.7 Separate Grade Lines

Separate or independent grade lines are appropriate in some cases for freeways and expressways.

They are not normally considered appropriate where medians are less than 65 feet wide (see Index 305.6). Exceptions to this may be minor differences between opposing grade lines in special situations.

In addition, for either interim or ultimate expressways, any appreciable grade differential between roadbeds should be avoided in the vicinity of at-grade intersections. For traffic entering from the crossroad, confusion and wrong-way movements could result if the pavement of the far roadway is obscured because of excessive grade differential.

204.8 Grade Line of Structures

(1) Structure Depth. The depth to span ratio for each structure is dependent on many factors. Some of these are: span, type of construction, aesthetics, cost, falsework limitations, and vertical clearance limitations. For purposes of preliminary planning and design, the depth to span ratios listed below may be used in setting grade lines at grade separations.

(a) Railroad Underpass Structures.

- Single track, through girder type structures: use 5-foot depth from top of rail to structure soffit (bottom of girder).
- Deck-type structures: for simple spans use d/s (depth to span ratio)= 0.08; for continuous multiple span structures use d/s= 0.07. These ratios do not include the additional 2 feet required above the deck for ballast and rail height.

(b) Highway Structures.

- Structures with single spans of 100 feet or less, use d/s= 0.06.
- Structures with single spans between 100 feet and 180 feet use d/s= 0.045.
- Continuous structures with multiple spans of 100 feet or less, use d/s= 0.055.
- Continuous structures with multiple spans of more than 100 feet, use d/s= 0.04.
- Geometric plans should be submitted to the DES – Structure Design prior to preparation of the project report so that preliminary studies can be prepared. Preliminary bridge type selection should be a joint effort between the DES – Structure Design and the District.

(2) Steel or Precast Concrete Structures. Steel and precast concrete girders in lieu of cast-in-place concrete eliminate falsework, and may permit lower grade lines and reduced approach fill heights. Potential cost savings from elimination of falsework, lowered grade lines, and the ability to accommodate settlement beneath the abutments should be considered in structure type selection along with unit price, aesthetics, uniformity, and any other relevant factors. Note that grade lines at grade separations frequently need to be adjusted after final structure depths are determined (see Index 309.2(3)). Details of traffic handling and stage construction should be provided when the bridge site plan is submitted to the DES – Structure Design if the design or construction of the structure is affected (see Drafting and Plans Manual, Section 3-3.2).

(3) Depressed Grade Line Under Structures. Bridge and drainage design will frequently be simplified if the low point in the grade line is set a sufficient distance from the intersection of the centerlines of the structure and the highway so that drainage structures clear the structure footings.

(4) Grade Line on Bridge Decks. Vertical curves on bridge decks should provide a minimum fall of 0.05-foot per station. This fall should not extend over a length greater than 100 feet. The flattest allowable tangent grade should be 0.3 percent.

(5) Falsework. In many cases, it is economically justified to have falsework over traffic during construction in order to have a support-free open area beneath the permanent structure. The elimination of permanent obstructions usually outweighs objections to the temporary inconvenience of falsework during construction.

Because the width of traffic openings through falsework can, and oftentimes does, significantly affect costs, special care should be given to determining opening widths. The

following should be considered: staging and traffic handling requirements, accommodation of pedestrians and bicyclists, the width of approach roadbed that will exist at the time the bridge is constructed, traffic volumes, needs of the local agencies, controls in the form of existing facilities, and the practical challenges of falsework construction.

The normal width of traffic openings and required falsework spans are shown in Table 204.8.

The normal spans shown in Table 204.8 are for anchored temporary K-rail. When temporary K-rail is not anchored, add 4 feet to normal span to include K-rail deflection.

The minimum vertical falsework clearance over freeways and nonfreeways shall be 15 feet. The following items should be considered:

- Mix, volume, and speed of traffic.
- Effect of increased vertical clearance on the grade of adjacent sections.
- Closing local streets to all traffic or trucks only during construction.
- Detours.
- Carrying local traffic through construction on subgrade.
- Temporary or permanent lowering of the existing facility.
- Cost of higher clearance versus cost of traffic control.
- Desires of local agency.

Worker safety should be considered when determining vertical falsework clearance. Requests for approval of temporary vertical clearances less than 15 feet should discuss the impact on worker safety.

Temporary horizontal clearances less than shown in Table 204.8 or temporary vertical clearances less than 15 feet should be noted in the PS&E Transmittal Report.

To establish the grade of a structure to be constructed with a falsework opening, allowance must be made for the depth of the falsework. The minimum depths required for various widths of traffic opening are shown in Table 204.8.

Where vertical clearances, either temporary or permanent are critical, the District and the DES – Structure Design should work closely during the early design stage when the preliminary grades, structure depths, and falsework depths can be adjusted without incurring major design changes.

Where the vertical falsework clearance is less than 15 feet, advance warning devices are to be specified or shown on the plans. Such devices may consist of flashing lights, overhead signs, over-height detectors, or a combination of these or other devices.

Warning signs on the cross road or in advance of the previous off-ramp may be required for overheight permit loads. Check with the Regional Permit Manager.

After establishing the opening requirements, a field review of the bridge site should be made by the District designer to ensure that existing facilities (drainage, other bridges, or roadways) will not conflict with the falsework.

The placement and removal of falsework requires special consideration. During these operations, traffic should either be stopped for short intervals or diverted away from the span where the placement or removal operations are being performed. The method of traffic handling during these operations is to be included in the Special Provisions.

Topic 205 - Road Connections and Driveways

205.1 Access Openings on Expressways

Access openings are used only on expressways. The term access opening applies to openings through the right of way line which serve abutting land ownerships whose remaining access rights have been acquired by the State.

(1) Criteria for Location. Access openings should not be spaced closer than one-half mile to an adjacent public road intersection or to another

Table 204.8
Falsework Span and Depth Requirements

Facility to be Spanned	Minimum Normal Width of Traffic Opening (2)(3)(4)	Resulting Falsework	Depth of Superstructure(5)			
			Up to 6 feet	Up to 8 feet	Up to 10 feet	Up to 12 feet
		Normal Span(1)	Minimum Falsework Depth			
Freeway & Non Freeway	20'	28'	1'-9"	1'-10"	1'-10"	1'-10½"
	25'	33'	1'-10½"	2'-1'	2'-1'	2'-8½"
	32'	40'	2'-0"	2'-8½"	2'-9"	3'-0"
	37'	45'	2'-9"	2'-11½"	3'-0"	3'-3"
	40'	48'	3'-0"	3'-0"	3'-2½"	3'-3"
	49'	57'	3'-3"	3'-3½"	3'-3½"	3'-3½"
	52'	60'	3'-3"	3'-3½"	3'-3½"	3'-4"
	61'	69'	3'-5"	3'-5"	3'-7"	3'-7½"
	64'	72'	3'-5"	3'-7½"	3'-7½"	3'-8"
	73'	81'	3'-6"	3'-9"	3'-9"	3'-9"

NOTES:

(1) Includes 8' for two temporary K-rails and 2' to center line of post including 3" clearance between K-rail and footing pad. This is for K-rail anchored to the pavement.

(2) Approach roadway width measured normal to lanes. Use next highest width if the approach roadway width is not shown in the table.

(3) Dependent upon the width of approach roadbed available at the time of bridge construction.

(4) Clear vehicular opening between temporary railings.

(5) See Index 204.8 for preliminary depth to span ratios. For more detailed information, contact the Division of Engineering Services, Structure Design and refer to the Bridge Design Aids.

private access opening that is wider than 30 feet. When several access openings are closely spaced, a frontage road should be considered (see Index 104.3). To discourage wrong-way movements, access openings should be located directly opposite, or at least 300 feet from a median opening.

Sight distance equivalent to that required for public road intersections shall be provided (see Index 405.1).

(2) Width. The normal access opening width should be 30 feet. A greater width may result in large savings in right of way costs in some instances, but should be considered with caution because of the possibility that public use might develop. Conversion of a private opening into a public road connection requires the consent of the CTC, which cannot be committed in advance (see the Project Development Procedures Manual).

(3) Recessed Access Openings. Recessed access openings, as shown on Figure 205.1, are desirable at all points where private access is permitted and should be provided whenever they can be obtained without requiring alterations to existing adjacent improvements. When recessed openings are required, the opening should be located a minimum distance of 75 feet from the nearest edge of the traveled way.

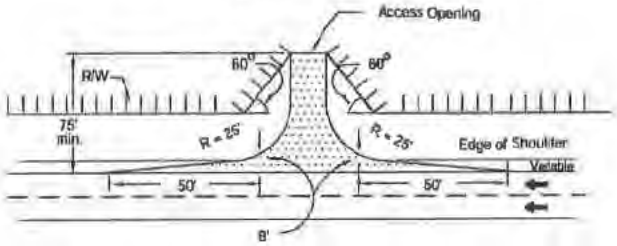
(4) Joint Openings. A joint access opening serving two or more parcels of land is desirable whenever feasible. If the property line is not normal to the right of way line, care should be taken in designing the joint opening so that both owners are adequately served.

(5) Surfacing. All points of private access should be surfaced with adequate width and depth of pavement to serve the anticipated traffic. The surfacing should extend from the edge of the traveled way to the right of way line.

205.2 Private Road Connections

The minimum private road connection design is shown on Figure 205.1. Sight distance requirements for the minimum private road connection are shown on Figure 405.7 (see Index 405.1(2)(c)).

Figure 205.1
Access Openings on Expressways



RECESSED OPENING

NOTES:

- By widening the expressway shoulder, deceleration lanes may be provided where justified.
- This detail, without the recess, may be used on conventional highways.

205.3 Urban Driveways

These instructions apply to the design of driveways to serve property abutting on State highways in cities or where urban type development is encountered.

Details for driveway construction are shown on the Standard Plans. Corner sight distance requirements are not applied to urban driveways. See Index 405.1(2) for further information.

(1) Correlation with Local Standards. Where there is a local requirement regulating driveway construction, the higher standard will normally govern.

(2) Driveway Width. The width of driveways for both residential and commercial usage is measured at the throat, exclusive of any flares. ("W" as shown in Standard Plan A87A).

(3) Residential Driveways. The width of single residential driveways should be 12 feet minimum and 20 feet maximum. The width of a double residential driveway such as used for multiple dwellings should be 20 feet minimum and 30 feet maximum. The width selected should be based on an analysis of the anticipated volume, type and speed of traffic, location of buildings and garages, width of street, etc.

(4) *Commercial Driveways.* Commercial driveways should be limited to the following maximum widths:

(a) When the driveway is used for one-way traffic, the maximum width should be 25 feet. If the driveway serves a large parcel, where large volumes of vehicles or large vehicles are expected, the entrance maximum width should be 40 feet and the exit maximum width should be 35 feet.

(b) When the driveway is used for two-way traffic, the maximum width should be 35 feet. If the driveway serves a large parcel, where large volumes of vehicles or large vehicles are expected, then the maximum width should be 45 feet.

(c) When only one driveway serves a given property, in no case should the width of the driveway including the side slope distances exceed the property frontage.

(d) When more than one driveway is to serve a given property, the total width of all driveways should not exceed 70 percent of the frontage where such a frontage is 100 feet or less. Where the frontage is more than 100 feet, the total driveway width should not exceed 60 percent of the frontage. In either case, the width of the individual driveway should not exceed those given in the preceding paragraphs. Where more than one driveway is necessary to serve any one property, not less than 20 feet of full height curb should be provided between driveways. This distance between driveways also applies to projects where curbs and gutters are not to be placed.

(e) Certain urban commercial driveways may need to accommodate the maximum legal vehicle. The width will be determined by the use of truck turn templates.

(5) *Surfacing.* Where curbs, gutters, and sidewalks are to be placed, driveways should be constructed of portland cement concrete. Where only curbs and gutters are to be placed and pedestrian traffic or adjacent improvements do not warrant concrete driveway construction, the driveway may be paved with the same materials used for existing surfacing on the property to be served.

(6) *Pedestrian Access.* Where sidewalks traverse driveways, the sidewalk shall continue across the driveway to alert driveway users that they are crossing a pedestrian walkway, and must yield to pedestrians on the sidewalk. Driveway corner radii should also be minimized to encourage low-speed turns by motorized vehicles and bicycles. For accessibility requirements, see DIB 82. Provision of this feature, as indicated in the Standard Plans, may require the acquisition of a construction easement or additional right of way. Assessment of these needs must be performed early enough in the design to allow time for acquiring any necessary permits or right of way. Additionally, designers should consider the following:

- In many cases providing the pathway along the back of the driveway will lower the elevation at the back of the sidewalk. Depending on grades behind the sidewalk the potential may exist for roadway generated runoff to enter private property. The need for features such as low berms within the construction easement, or installation of catch basins upstream of the driveway should be determined.

When there are no sidewalks or other pedestrian facilities that follow the highway, the designer may develop driveway details that eliminate the flatter portion along the back edge in lieu of using the Standard Plans for driveways. Refer to Topic 105 for additional information related to pedestrian facilities.

205.4 Driveways on Frontage Roads and in Rural Areas

On frontage roads and in rural areas where the maximum legal vehicle must be accommodated, standard truck-turn templates should be used to determine driveway widths where the curb or edge of traveled way is so close to the right of way line that a usable connection cannot be provided within the standard limits.

Where county or city regulations differ from the State's, it may be desirable to follow their regulations, particularly where jurisdiction of the frontage road will ultimately be in their hands.

For corner sight distance, see Index 405.1(2)(c).

Driveways connecting to State highways shall be paved a minimum of 20 feet from the edge of shoulder or to the edge of State right of way, whichever is less to minimize or eliminate gravel from being scattered on the highway and to provide a paved surface for vehicles and bicycles to accelerate and merge. Where larger design vehicles are using the driveway (e.g., dump trucks, flat bed trucks, moving vans, etc.), extend paving so the drive wheels will be on a paved surface when accelerating onto the roadway. For paving at crossings with Class I bikeways (Bike Paths), see Index 1003.1(6)

205.5 Financial Responsibility

Reconstructing or relocating any access openings, private road connections, or driveways required by revisions to the State highway facility should be done at State expense by the State or its agents. Reconstruction or relocation requested by others should be paid for by the requesting party.

Topic 206 - Pavement Transitions

206.1 General Transition Standards

Pavement transition and detour standards should be consistent with the section having the features built to the highest design standards. The transition should be made on a tangent section whenever possible and should avoid locations with horizontal and vertical sight distance restrictions. Whenever feasible, the entire transition should be visible to the driver of a vehicle approaching the narrower section. The design should be such that intersections at grade within the transition area are avoided. For decision sight distance at lane drops, see Index 201.7.

206.2 Pavement Widenings

(1) Through Lane Additions. Where through lanes, climbing lanes, or passing lanes are added, the minimum recommended distance over which to transition traffic onto the additional width is 250 feet per lane. Figure 206.2 shows several examples of acceptable methods for adding a lane in each direction to a two-lane highway.

(2) Turning, Ramp, and Speed Change Lanes. Transitions for lane additions, either for left or right turns or to add a lane to a ramp, should typically occur over a length of 120 feet. Lengths shorter than 120 feet are acceptable where design speeds are below 45 miles per hour or for conditions as stated in Index 405.2(2)(c).

Where insufficient median width is available to provide for left turn lanes, through traffic will have to be shifted to the outside. See Figures 405.2A, B and C for acceptable methods of widening pavement to provide for median turn lanes.

(3) Lane Widening. An increase in lane width can occur at short radius curves which are widened for truck off-tracking, at ramp terminals with large truck turning volumes, or when new construction matches existing roadways with narrow lane widths. Extensive transition lengths are not necessary as the widening does not restrict the driver's expectations. Transition tapers for these types of situations should be at 10:1 (longitudinal to lateral).

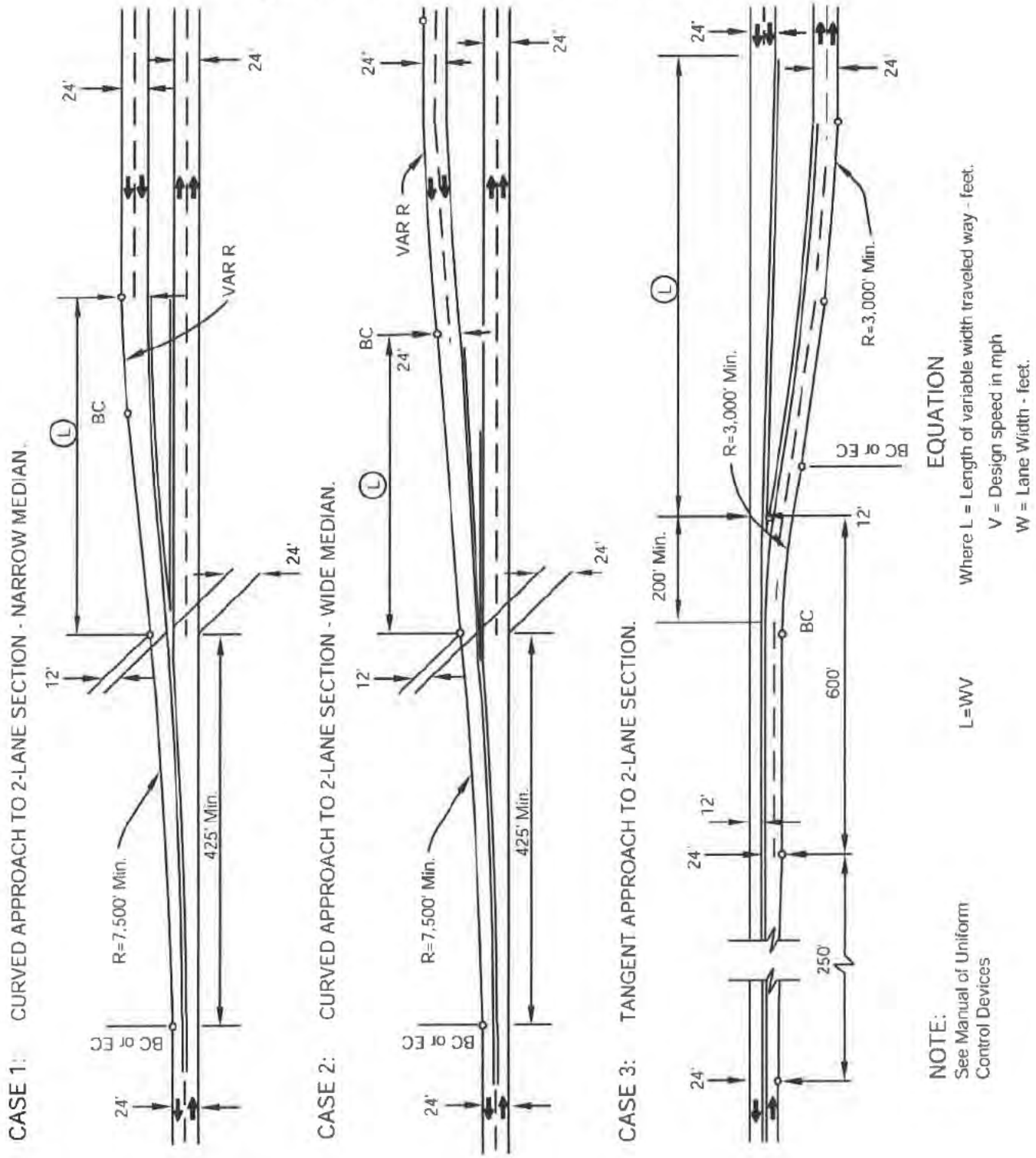
(4) Shoulder and Bicycle Lane Widening. Shoulder and bicycle lane widening should normally be accomplished in a manner that provides a smooth transition.

206.3 Pavement Reductions

(1) Through Lane Drops. When a lane is to be dropped, it should be done by tapering over a distance equal to WV, where W = Width of lane to be dropped and V = Design Speed. In general, the transition should be on the right so that traffic merges to the left. Figure 206.2 provides several examples of acceptable lane drops at 4-lane to 2-lane transitions. The exception to using the WV criteria is for the lane drop/freeway merge movement on a branch connection which is accomplished using a 50:1 taper.

(2) Ramp and Speed Change Lanes. As shown in Figures 504.2A and 504.3K, the standard taper for a ramp merge into a through traffic lane is 50:1 (longitudinal to lateral). Where ramp

Figure 206.2
Typical Two-lane to Four-lane Transitions



lanes are dropped prior to the merge with the through facility, the recommended taper is 50:1 for design speeds over 45 miles per hour, and the taper distance should be equal to WV for speeds below 45 miles per hour.

The "Ramp Meter Design Guidelines" also provide information on recommended and minimum tapers for ramp lane merges. These guideline values are typically used in retrofit or restricted right-of-way situations, and are acceptable for the specific conditions stated in the guidelines.

Figure 405.9 shows the standard taper to be used for dropping an acceleration lane at a signalized intersection. This taper can also be used when transitioning median acceleration lanes.

Figures 405.2A, B and C show the recommended methods of transitioning pavement back into the median area on conventional highways after the elimination of left-turn lanes.

(3) *Lane Reductions.* At any location where lane widths are being reduced, the minimum length over which to accomplish the transition should be equal to WV. See Index 504.6 for mainline lane reductions at interchanges.

(4) *Shoulder Reduction.* Shoulder reductions should typically occur over a length equal to ¾WV. However, when shoulder widths are being reduced in conjunction with a lane addition or widening (as in Alt. A of Figure 504.3J), the shoulder reduction should be accomplished over the same distance as the addition or widening.

206.4 Temporary Freeway Transitions

It is highly desirable that the design standards for a temporary transition between the end of a freeway construction unit and an existing highway should not change abruptly from the freeway standards. Temporary freeway transitions must be reviewed by the District approval authority or Project Delivery Coordinator, depending upon the current District Design Delegation Agreement.

Topic 207 - Airway-Highway Clearances

207.1 Introduction

(1) *Objects Affecting Navigable Airspace.* An object is considered an obstruction to air navigation if any portion of that object is of a height greater than the approach and transitional surfaces extending outward and upward from the airport runway. These objects include overhead signs, light standards, moving vehicles on the highway and overcrossing structures, equipment used during construction, and plants.

(2) *Reference.* The Federal Aviation Administration (FAA) has published Federal Aviation Regulation (FAR) Part 77 relative to airspace clearance entitled, Safe, Efficient Use, and Preservation of the Navigable Airspace, dated July 21, 2010. This is an approved reference to be used in conjunction with this manual.

207.2 Clearances

(a) Civil Airports--See Figure 207.2A.

(b) Heliports--See Figure 207.2B.

(c) Military Airports--See Figure 207.2C.

(d) Navy Carrier Landing Practice Fields--See Figure 207.2D.

207.3 Submittal of Airway-Highway Clearance Data

The following procedure must be observed in connection with airway-highway clearances in the vicinity of airports and heliports.

Notice to the FAA is required when highway construction is planned near an airport (civil or military) or a heliport. As a practical guide, the need to provide notice to the FAA should be reviewed any time construction or alteration is planned within 5 miles of an airport. A "Notice of Proposed Construction or Alteration" must be submitted to the FAA Administrator when required under criteria listed in Paragraph 77.9 of the latest Federal Aviation Regulations, Part 77. Such notice should be given as soon as highway alignment and grade are firmly established. However, at a minimum except for certain emergency situations outlined in FAR Part

77, the notice must be provided at least 45 days before the start date of the proposed construction or alteration or the date an application for a construction permit is filed, whichever is earlier. It should be noted that these requirements apply to both permanent objects and construction equipment. Electronic filing of FAA Form 7460-1, "Notice of Proposed Construction", is preferred by the FAA. This form and guidance for the submission may be found at https://oeaaa.faa.gov/oeaaa/external/portal.jsp.

When required, four copies of FAA Form 7460-1, and accompanying scaled maps should be sent to:

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177
Fax: (817) 222-5920

Copies of FAA Form 7460-1 may be obtained from the Caltrans, Division of Aeronautics or at https://oeaaa.faa.gov/oeaaa/external/portal.jsp.

The scaled maps accompanying FAA Form 7460-1 should contain the following minimum information.

- Distance from project to nearest runway.
- Elevation of runway thresholds.
- Relationship between the proposed highway horizontal alignment and vertical profile to the nearest runway or heliport primary surface. Include elevations of objects referenced to the elevation of the end of the runway, such as overhead lights, signs, structures, landscaping, and vehicles.

One copy of FAA Form 7460-1 should be forwarded to the Division of Design for information and one copy to the Division of Aeronautics for information and land use compatibility review.

Topic 208 – Bridges, Grade Separation Structures, and Structure Approach Embankment

208.1 Bridge Lane and Shoulder Width

(1) State Highways. **The clear width of all bridges, including grade separation structures, shall equal the full width of the traveled way and paved shoulders on the approaches with the following exceptions:**

(a) Bridges to be constructed as replacements on existing 2-lane, 2-way roads shall not have less than a 32-foot wide roadbed for ADT less than 400, and not less than 40-foot wide roadbed for ADT greater than 400. (see Index 307.2).

(b) When the approach shoulder width is less than 4 feet, the minimum offset on each side shall be 4 feet, and shall be documented in accordance with Index 82.2.

The width should be measured normal to the center line between faces of curb or railing measured at the gutter line. For offsets to safety shape barriers see Figure 208.1.

For horizontal and vertical clearances, see Topic 309.

(2) Roads Under Other Jurisdictions.

(a) Overcrossing Widths--(See Index 308.1)

(b) Undercrossing Span Lengths--Initial construction should provide for the ultimate requirements. In areas where the local jurisdiction has a definite plan of development, the ultimate right of way width or at least that portion needed for the roadbed and sidewalks should be spanned.

If the undercrossing street or road has no median, one should be provided where necessary to accommodate left-turn lanes or the center piers of the undercrossing structure.

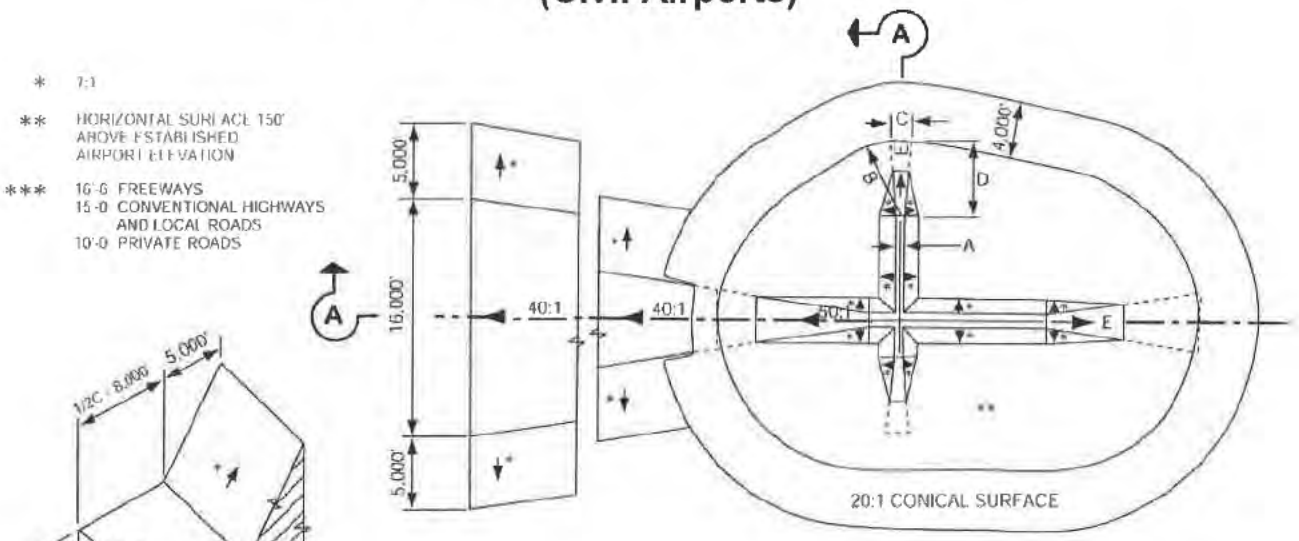
Where it appears that a 2-lane road will be adequate for the foreseeable future, but no right of way width has been established, a minimum span length sufficient for a 40-foot roadbed should be provided. Additional span length should be provided to permit future sidewalks where there is a foreseeable need. If it is reasonably foreseeable that more than two lanes will be required ultimately, a greater width should be spanned.

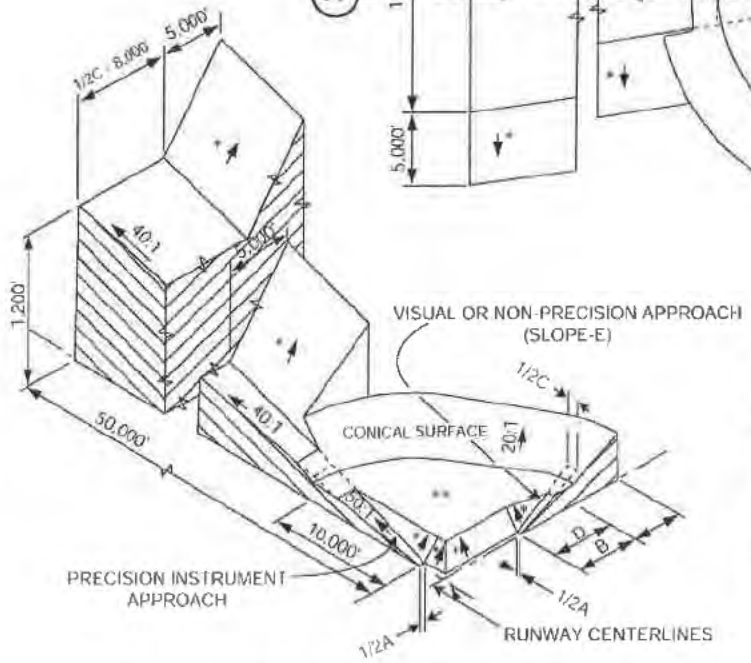
Figure 207.2A
Airway-Highway Clearance Requirements (Civil Airports)

* 7:1

** HORIZONTAL SURFACE 150' ABOVE ESTABLISHED AIRPORT ELEVATION

*** 16'-0 FREEWAYS
15'-0 CONVENTIONAL HIGHWAYS AND LOCAL ROADS
10'-0 PRIVATE ROADS





ISOMETRIC VIEW OF SECTION A-A

RUNWAY STANDARDS							
TYPES OF RUNWAY		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		I	II	I	III	IV	
DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	★
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	★

I UTILITY RUNWAY
II RUNWAYS LARGER THAN UTILITY
III VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
IV VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
★ PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

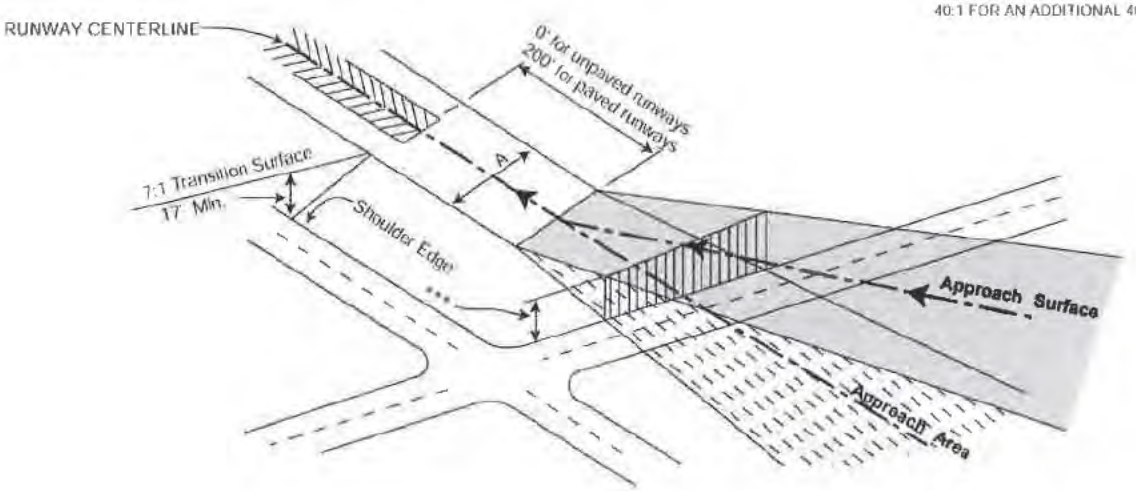
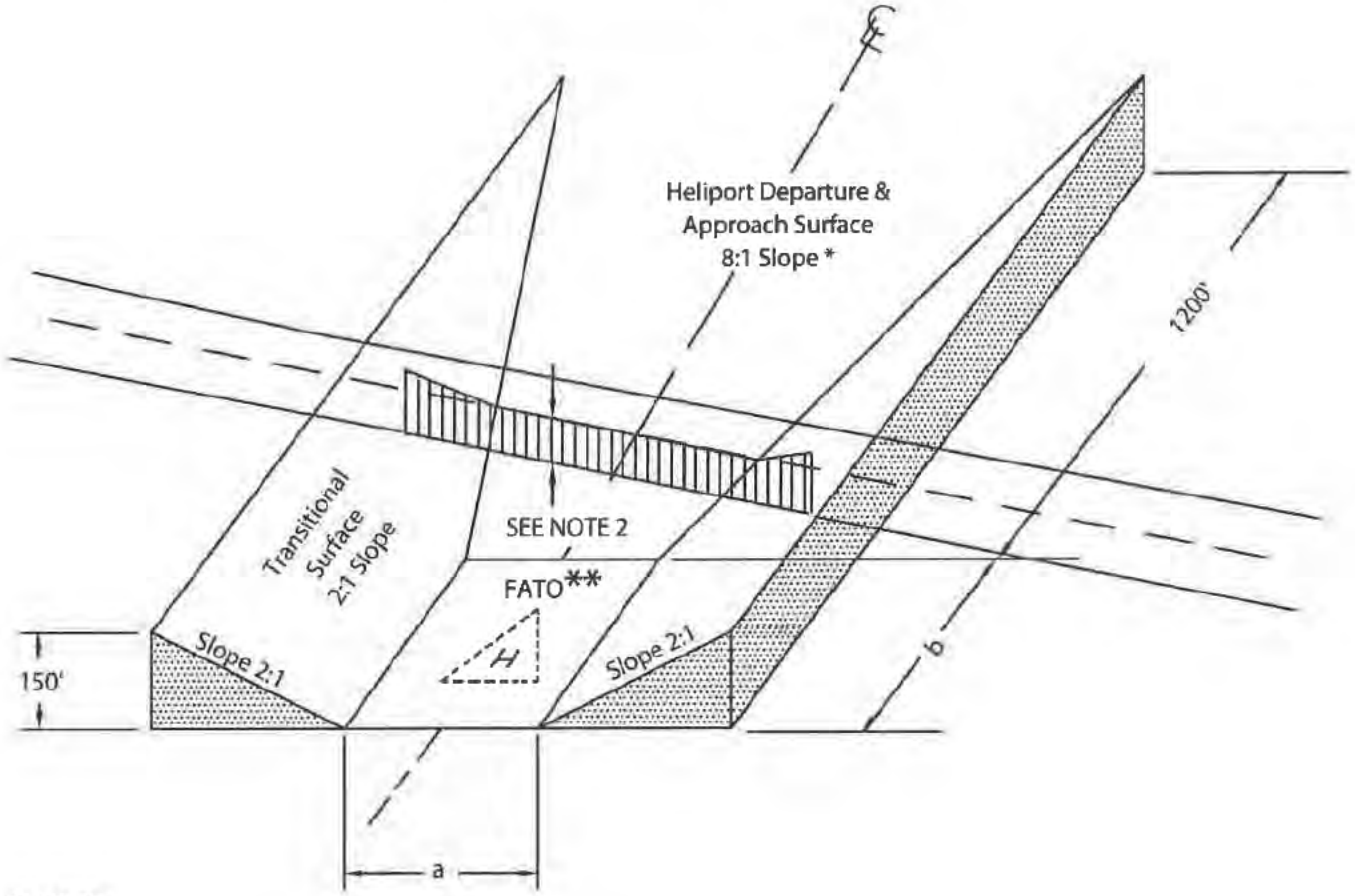


Figure 207.2B
Airway-Highway Clearance Requirements (Heliport)



NOTES:

(1) FATO dimensions "a" and "b" are equal to one and one-half times the overall length of the design helicopter, except for transport category heliports, where "a" equals two times the rotor diameter (100 feet Min.) and "b" equals two-times the rotor diameter (200 feet Min.). Check with heliport owner to verify helicopter category.

(2) Minimum vertical clearance is 17'-0" for freeways and 15'-0" for conventional highways and local roads, and 10'-0" for private roads.

(3) Contact the heliport owner/operator to determine the approved approach/departure paths.

Highway Clearance: Profile at pavement edge near airfield

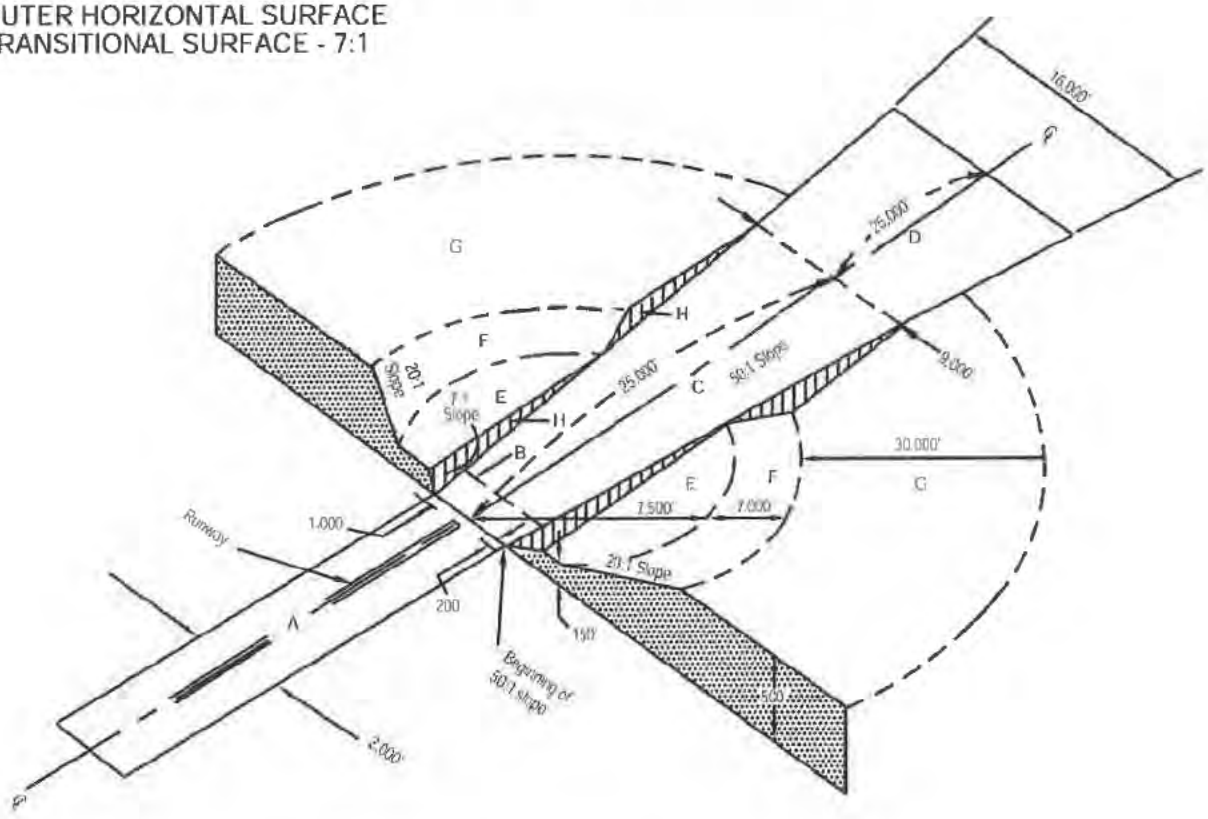
* 10:1 for Military Heliports

** Final Approach/Take Off Area

Figure 207.2C
Airway-Highway Clearance Requirements (Military Airports)

LEGEND

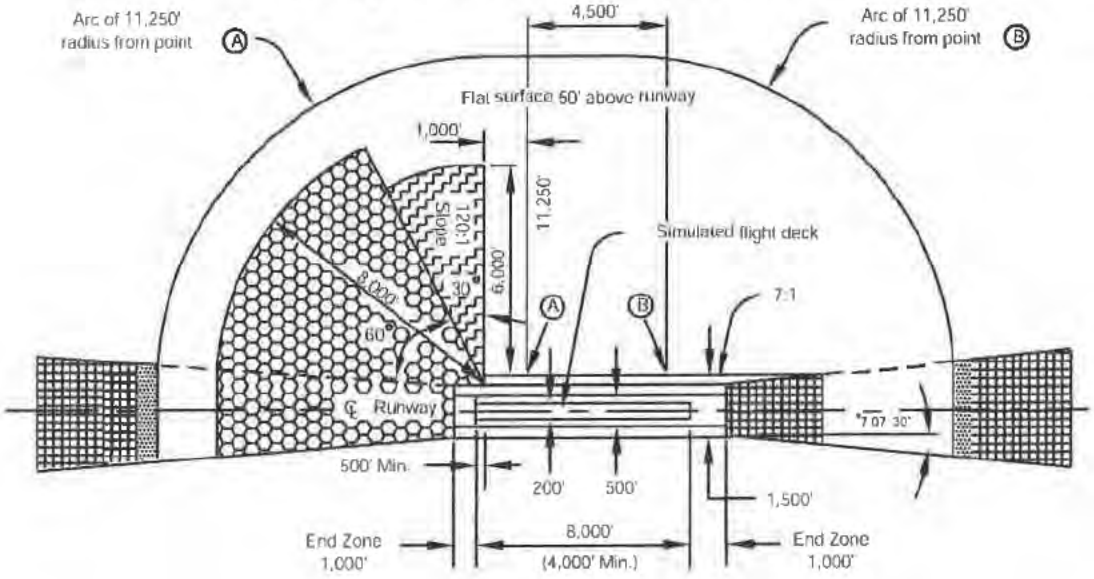
A- PRIMARY SURFACE
B- CLEAR ZONE SURFACE
C- APPROACH - DEPARTURE CLEARANCE SURFACE (GLIDE ANGLE) - 50:1
D- APPROACH - DEPARTURE CLEARANCE SURFACE (HORIZONTAL)
E- INNER HORIZONTAL SURFACE
F- CONICAL SURFACE - 20:1
G- OUTER HORIZONTAL SURFACE
H- TRANSITIONAL SURFACE - 7:1



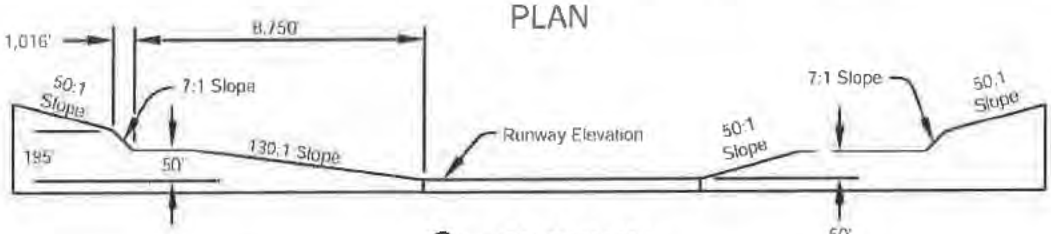
NOTE:

MINIMUM VERTICAL CLEARANCE IS 16'-6" FOR FREEWAYS, 15'-0" FOR CONVENTIONAL HIGHWAYS AND LOCAL ROADS, AND 10'-0" FOR PRIVATE ROADS.

Figure 207.2D
Airway-Highway Clearance Requirements
(Navy Carrier Landing Practice Field)



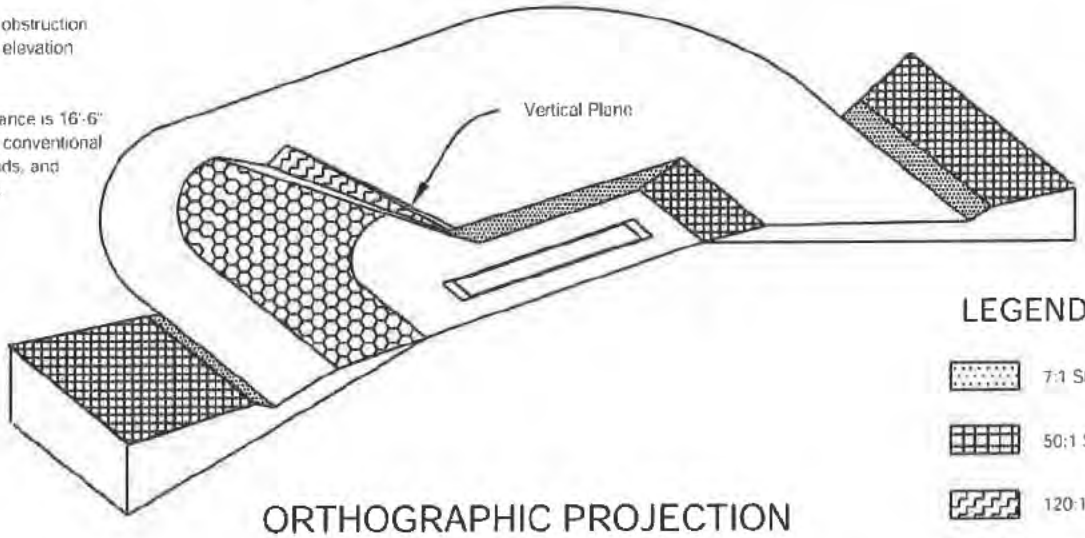
PLAN



℄ SECTION

NOTES

1. Elevation datum for all obstruction clearance zones is the elevation of the runway
2. Minimum vertical clearance is 16'-6" for freeways, 15'-0" for conventional highways and local roads, and 10'-0" for private roads



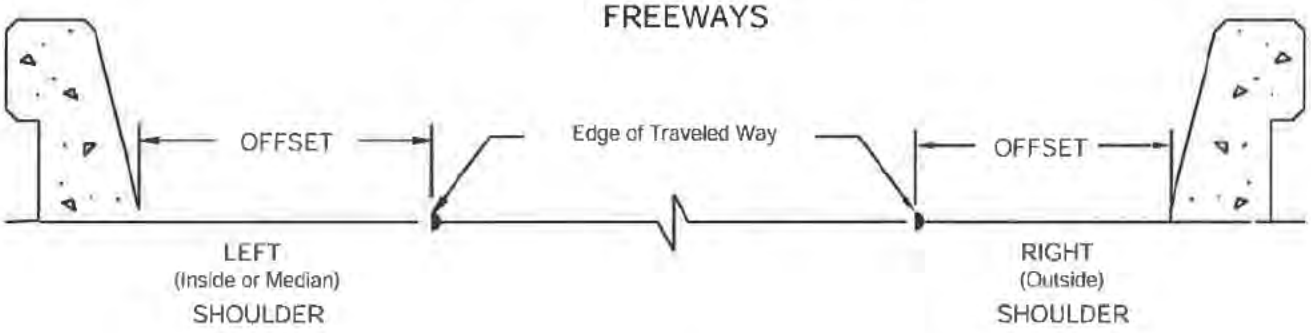
ORTHOGRAPHIC PROJECTION

LEGEND

- 7:1 Slope
- 50:1 Slope
- 120:1 Slope
- 130:1 Slope

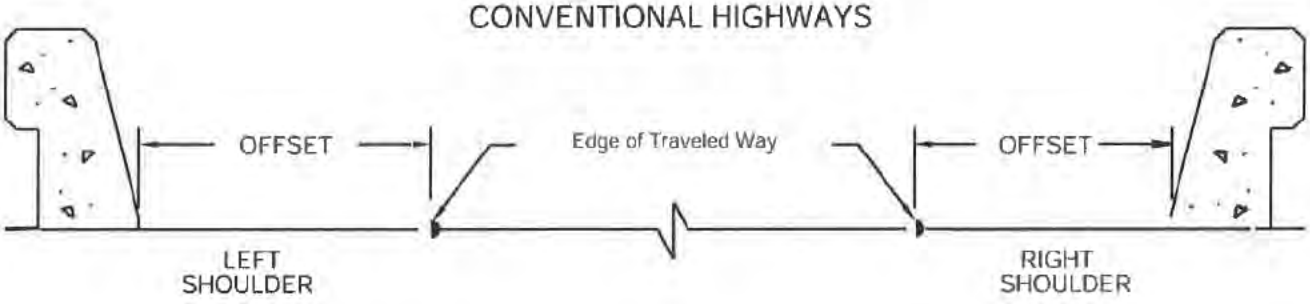
Figure 208.1
Offsets to Safety-Shape Barriers

FREEWAYS



Approach Shoulder Width	Left Shoulder	Right Shoulder
* 2' & 4' (Ramps)	4'	4'
5'	5'	5'
8'	8'	8'
10'	10'	10'

CONVENTIONAL HIGHWAYS



Approach Shoulder Width	Left Shoulder	Right Shoulder
* 2' & 4'	4'	4'
8'	8'	8'

* See Index 208.1(1)(b)

(c) For horizontal and vertical clearances, see Topic 309.

208.2 Cross Slope

The crown is normally centered on the bridge except for one-way bridges where a straight cross slope in one direction should be used. The cross slope should be the same as for the approach pavement (see Index 301.3 and Index 203.9).

208.3 Median

On multilane divided highways a bridge median that is 36 feet wide or less should be decked. Exceptions require individual analysis. See Traffic Safety Systems Guidance for median barrier warrants.

208.4 Bridge Sidewalks

Sidewalks on bridges should be provided wherever there are sidewalks or other pedestrian facilities that follow the highway. **The minimum width of a bridge sidewalk shall be 6 feet.** The recommended width should be 8 feet for pedestrian comfort. Bridges sidewalks in area types (see Index 81.2) with high levels of pedestrian activity may need to be greater than 8 feet (see Figure 208.10B).

208.5 Open End Structures

Embankment end slopes at open end structures should be no steeper than 1½:1 for all highways.

208.6 Bicycle and Pedestrian Overcrossings and Undercrossings

A bicycle overcrossing (BOC) or undercrossing (BUC) is a facility that provides a connection between bikeways or roads open to bicycling. They are considered Class I bikeways, or in certain situations may be considered Class IV bikeways. See Index 1003.1 for Class I bikeway guidance or DIB 89 for Class IV bikeways (separated bikeways) guidance.

A pedestrian overcrossing (POC) or undercrossing (PUC) is a facility that provides a connection between pedestrian walkways.

The minimum width of walkway for pedestrian overcrossing should be 8 feet. The minimum vertical clearance of a pedestrian undercrossing should be 10 feet. Skewed crossings should be avoided.

Class I bikeways are designed for the exclusive use of bicyclists and pedestrians; equestrian access is prohibited. See Chapter 1000 for Class 1 bikeway design guidance and Index 208.7 for equestrian undercrossing guidance. For additional information about the need to separate bicyclists from equestrian trails, see Index 1003.4.

POC's and PUC's must be designed to comply with DIB 82.

See Topic 309 for vertical clearances.

208.7 Equestrian Undercrossings and Overcrossings

Such structures should normally provide a clear opening 10 feet high and 10 feet wide. Skewed crossings should be avoided. The structure should be straight so the entire length can be seen from each end. Sustained grades should be a maximum of 10 percent. Decomposed granite or similar material should be used for the trail surface. While flexible pavement is permissible, a rigid pavement should not be used. See Index 1003.4 for separation between bicycle paths and equestrian trails. See DIB 82 for when trails are open to pedestrians.

Design guidance for equestrian overcrossings is pending.

208.8 Cattle Passes, Equipment, and Deer Crossings

Private cattle passes and equipment crossings may be constructed when economically justified by a right of way appraisal, as outlined in Section 7.09.09.00 of the Right of Way Manual.

The standard cattle pass should consist of either a standard box culvert with an opening 8 feet wide and 8 feet high or a metal pipe 120 inches in diameter. The invert of metal pipe should be paved with concrete or bituminous paving material.

If equestrian traffic is expected to use the culvert a minimum 10 feet wide by 10 feet high structure may be provided. However, the user of the facility should be contacted to determine the specific requirements.

If conditions indicate a reasonable need for a larger than standard cattle pass, it may be provided if economically justified by the right of way appraisal.

In some cases the installation of equipment or deer crossings is justified on the basis of public interest or need rather than economics. Examples are:

(a) A deer crossing or other structure for environmental protection purposes.

(b) Equipment crossings for the Forest Service or other governmental agencies or as a right of way obligation.

These facilities should be installed where necessary as determined by consultation with the appropriate affected entities.

A clear line of sight should be provided through the structure.

208.9 Railroad Underpasses and Overheads

Generally, it is desirable to construct overheads rather than underpasses whenever it is necessary for a highway and railroad to cross. Railroads should be carried over highways only when there is no other reasonable alternative.

Some undesirable features of underpasses are:

(a) They create bottlenecks for railroad operations.

(b) It is difficult to widen the highway.

(c) Pumping plants are often required to drain the highway.

(d) They are likely to lead to cost participation controversies for initial and future construction.

(e) Shooflies (temporary tracks) are generally required during construction.

(f) Railroads are concerned about the structure maintenance and liability costs they incur.

Advantages of overheads are:

(a) Railroads can use most of their right of way for maintenance.

(b) Overheads can be widened at a relatively low cost and with little difficulty.

(c) Less damage may be incurred in the event of a derailment.

(d) Agreements for design and maintenance can be reached more easily with railroads.

(e) Initial costs are generally lower.

The State, the railroads, and the public in general can usually benefit from the construction of an overhead structure rather than an underpass. See Topic 309 for vertical clearances.

208.10 Bridge Barriers and Railings

(1) General. There are four classes of railings, each intended to perform a different function.

(a) Vehicular Barrier Railings--The primary function of these railings is to retain and redirect errant vehicles.

(b) Combination Vehicular Barrier and Pedestrian Railings--These railings perform the dual function of retaining both vehicles and pedestrians on the bridge. They consist of two parts--A concrete parapet barrier, generally with a sidewalk, and metal handrailing or fence-type railing.

(c) Pedestrian Railings--These railings prevent pedestrians from accidentally falling from the structure and, in the case of fence-type railing, reduce the risk of objects being dropped on the roadway below. See DIB 82 for additional requirements.

(d) Bicycle Railings--These railings retain bicycles and riders on the structure. They may be specifically designed for bicycles, or may be a combination type consisting of a vehicular barrier surmounted by a fence or metal handrail.

(2) Policies. To reduce the risk of objects being dropped or thrown upon vehicles, protective screening in the form of fence-type railings should be installed along new overcrossing structure sidewalks in urban areas (Sec. 92.6 California Streets and Highways Code). Screening should be considered for the opposite side of structures having one sidewalk. Screening should be installed at such other locations determined to be appropriate.

Railings and barriers with sidewalks should not be used on structures with posted speeds greater than 45 miles per hour without barrier separation. All structure railings with a sidewalk in the Standard Plans are approved for posted speeds up to 45 miles per hour. **Any use of railings and barriers with sidewalks on**

structures with posted speeds greater than 45 miles per hour shall have a barrier separation between the roadway and the sidewalk. The barrier separation type and the bridge rail selection requires approval by the District Traffic Engineer or designee.

The approved types of railings for use on bridge structures are listed below and illustrated in Figures 208.10A, B, and C. Railing types not listed are no longer in general use; however, they may be specified in those cases where it is desirable to match an existing condition.

The District should specify in the bridge site data submittal the rail type to be used after consideration has been given to the recommendations of the local agency (where applicable) and the DES-SD.

Barriers and railings are denoted by crash testing criteria and crash test level (TL). For more information on the crash test level, see the Traffic Safety Systems Guidance, Table 1, issued by the Division of Traffic Operations.

(3) Vehicular Barriers. See Figure 208.10A.

(a) Concrete Barrier Type 836 and 842 are TL-4 systems and satisfy the Manual for Assessing Safety Hardware (MASH 2016)--These vehicular barriers are for general use adjacent to traffic. Figure 208.1 illustrates the position of the barrier relative to the edge of traveled way.

(b) Concrete Barrier Type 80 and bridge metal rail barriers--Use of these barriers is intended in scenic areas where more see-through area is desired than is provided by a solid concrete parapet. These TL-4 barriers satisfy NCHRP Report 350.

(c) California ST-70SM Side Mounted Bridge Rail--This TL-4 steel barrier is 42 inches in height. This vehicular barrier is for general use adjacent to traffic. This barrier is especially useful when there are right-of-way issues or space limitations. This barrier satisfies MASH 2016.

(d) California ST-75 Bridge Rail—This TL-4 steel barrier is 36 inches in vehicular railing height and 42 inches in bicycle railing height. This combination vehicular barrier is for general use adjacent to traffic. This barrier replaces NCHRP Report 350 compliant California ST-70 or California ST-20S Bridge Rails. This barrier satisfies MASH 2016.

(e) Concrete Barrier Type 85—This TL-4 concrete barrier is 36 inches in vehicular railing height and 42 inches in bicycle railing height. This combination vehicular barrier is for general use adjacent to traffic. This barrier replaces NCHRP Report 350 compliant Concrete Barrier Type 80.

(4) Combination Railings. See Figure 208.10B.

(a) Concrete Barrier Type 732SW--This is TL-2 bridge railing for general use when sidewalks are provided on a bridge. It must be accompanied with a tubular handrailing or a fence-type railing. See Index 208.4 for minimum width, however, this width may be varied as circumstances require. This barrier satisfies MASH 2016.

(b) Concrete Barrier Type 80SW--Similar to the Concrete Barrier Type 80, modified with a raised integral sidewalk and tubular handrailing. This TL-2 barrier is intended for use in lower speed scenic areas where more see-through area is desired than is provided by a solid concrete parapet. See Index 208.4 for minimum width, however, this width may be varied as circumstances require. This barrier satisfies NCHRP Report 350.

(c) Aesthetic Low Maintenance Guardrail System--This TL-3 system is a combination railing (without integral sidewalk) of an aesthetic see-through bridge railing on a trench footing as an aesthetic low maintenance alternative to guardrail.

(d) Chain Link Railing Type 7--This is the fence-type railing for general use with Type 732SW or Type 80SW barrier railing with sidewalk to reduce the risk of objects being dropped off the edge of a structure. When a sidewalk is provided on one side

of a bridge and Type 736 barrier railing on the other side, Type 7 railing may be placed on top of the Type 736 as additional protection from dropped objects. Consideration should be given to the effect of the Type 7 railing on sight distance at the bridge ends and view over the side of the bridge. Lighting fixtures may be provided with Type 7 railings.

(e) Chain Link Railing Type 6--This railing may be used in lieu of Type 7 when special architectural treatment is required. It should not be used on curved alignment because of fabrication difficulties.

(f) Tubular Handrailing--This railing is used with Type 732SW, and Type 80SW to increase the combined rail height for the safety of pedestrians. It should be used in lieu of Type 7 where object dropping will not be a problem or at the ends of bridges to increase sight distance if fence-type railing would restrict sight distance.

(5) Pedestrian Railings. See Figure 208.10C

(a) Chain Link Railing Type 3--This railing is used on pedestrian structures to reduce the risk of objects being dropped on the roadway below.

(b) Chain Link Railing Type 7 (Modified)--This railing is similar to Type 7 except that it is mounted on the structure at the sidewalk level.

(c) Chain Link Railing--This railing is not as high as Types 3 or 7 and therefore, its use is restricted to those locations where object dropping or throwing will not be a problem.

(d) Chain Link Railing (Modification)--Existing railing may be modified for screening under the protective screening policy. The DES-SD should be contacted for details.

(6) Bicycle Railing. The height of bicycle rail shall not be less than 42.0 inches, measured from the top of the riding surface. In some cases the bicycle railing shall be offset 15.0 inches behind the face of the vehicular rail. Contact DES, Office of Design and Technical Services for more information. Pedestrian railings and combination railings consisting of a concrete barrier surmounted by a fence or tubular railing are satisfactory for bicycles, if a minimum 42-inch height is met. Bicycles are not considered to operate on a sidewalk, except in special cases where signs specifically direct cyclists to use a bike path or the sidewalk.

As a general policy, bicycle railings should be installed at the following locations:

(a) On a Class I bikeway, except that a lower rail may be used if a curbed sidewalk, not signed for bicycle use, separates the bikeway from the rail or a shoulder at least 8 feet wide exists on the other side of the rail.

(b) On the outside of a Class II or III bikeway, unless a curbed sidewalk, not signed for bicycle use, separates the bikeway from the rail.

(c) In other locations where the designer deems it reasonable and appropriate.

(7) Bridge Approach Railings. **Approach railings shall be installed at the ends of bridge railings exposed to approach traffic.**

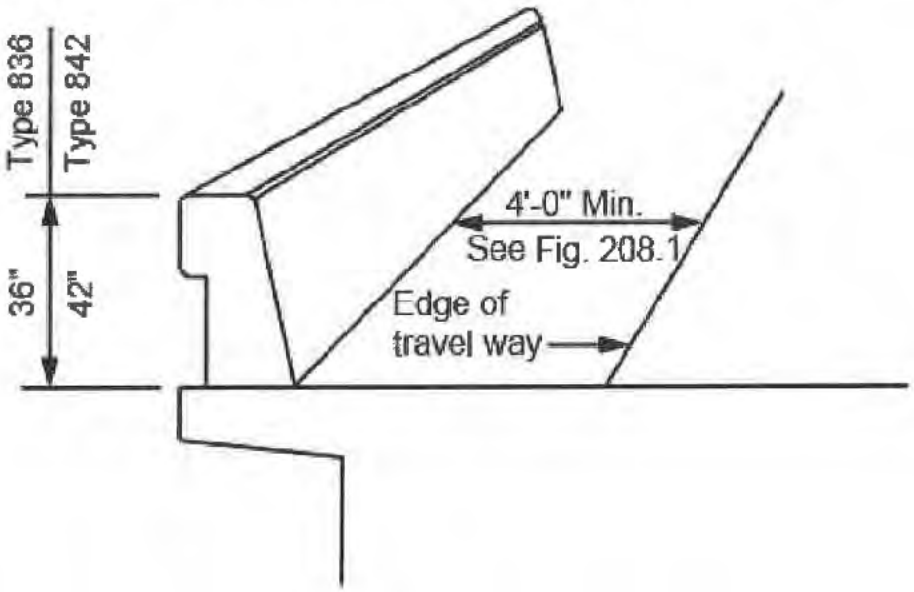
Refer to Traffic Safety Systems Guidance for placement and design criteria of guardrail.

208.11 Structure Approach Embankment

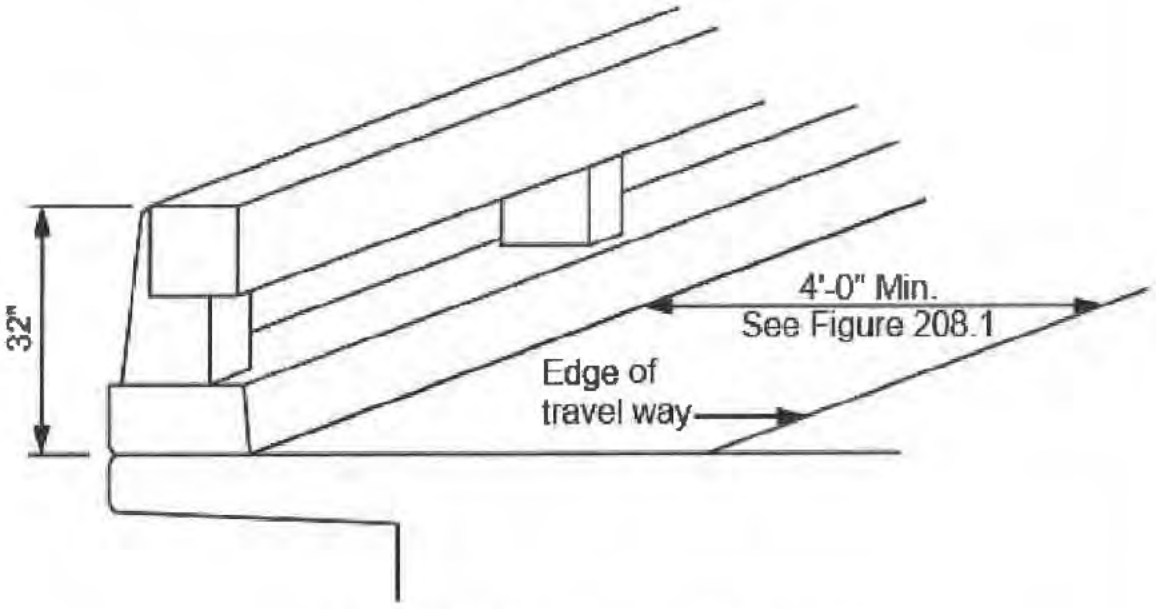
(1) General. Structure approach embankment is that portion of the fill material within approximately 150 feet longitudinally of the structure. Refer to Figure 208.11A for limits, the Standard Specifications, and Standard Special Provisions for more information.

Quality requirements for embankment material are normally specified only in the case of imported borrow. When select material or local borrow for use in structure abutment embankments is shown on the plans, the Resident Engineer (RE) is responsible for assuring the adequacy of the quantity and quality of the specified material. The Project Engineer should include adequate information and guidance in the RE File to assist the RE in fulfilling this responsibility.

Figure 208.10A
Vehicular Railings for Bridge Structures

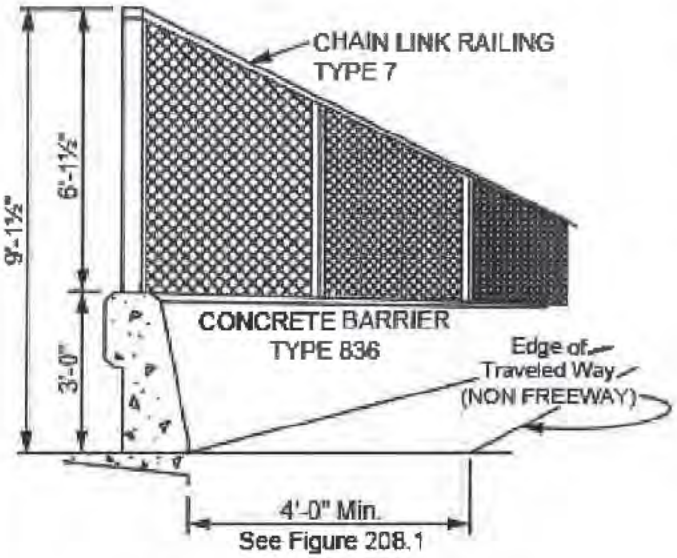


CONCRETE BARRIERS TYPE 836 AND TYPE 842
(MASH 2016 Compliant)

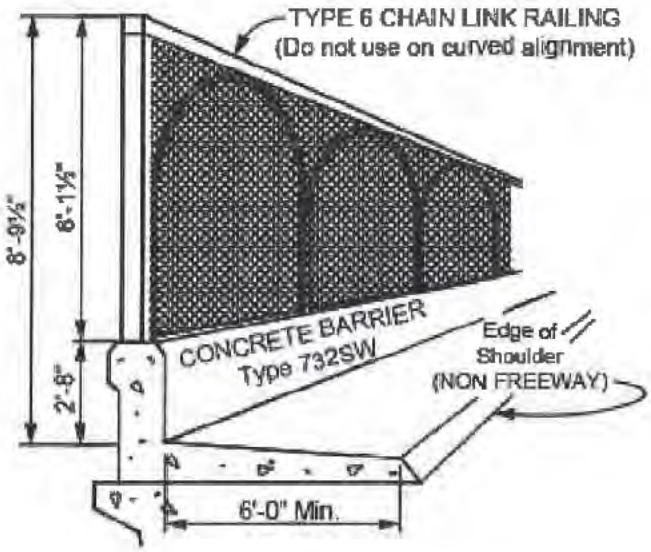


CONCRETE BARRIER TYPE 80
(NCHRP Report 350 Compliant)

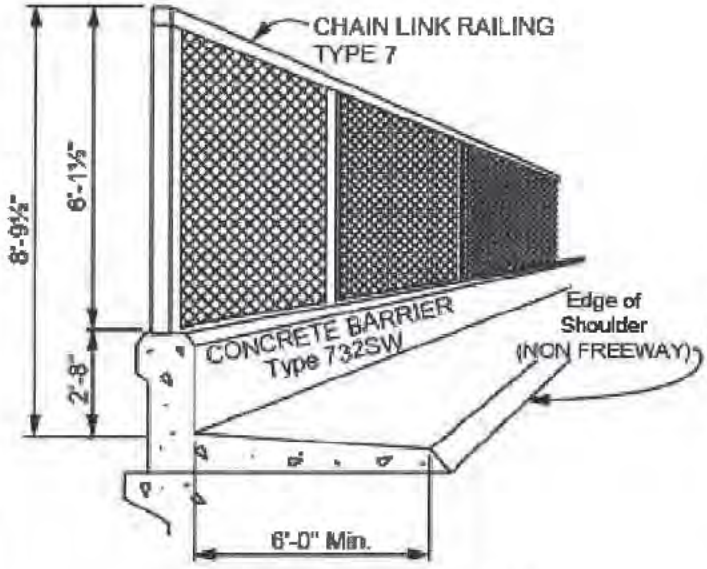
Figure 208.10B
Combination Vehicular Barrier and Pedestrian Railings for Bridge Structures



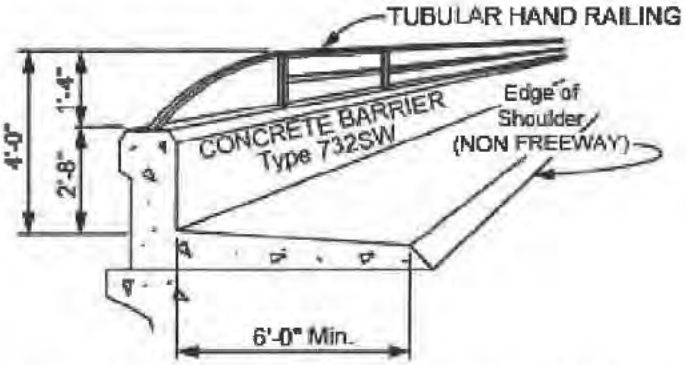
TYPE 836 WITH TYPE 7



TYPE 732SW WITH TYPE 6

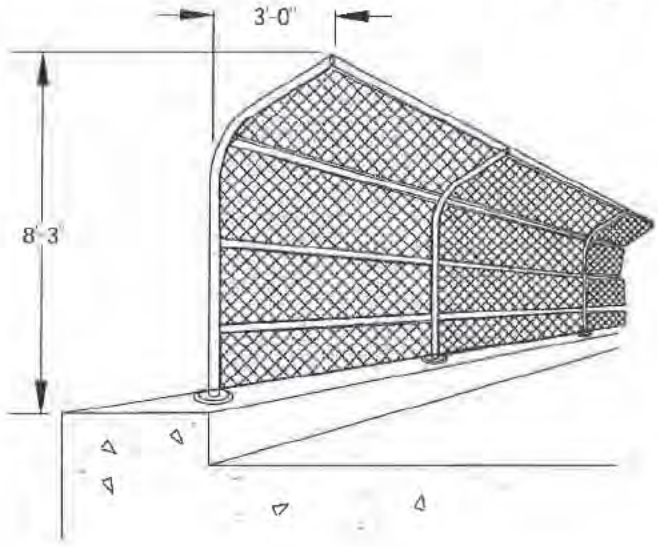


TYPE 732SW WITH TYPE 7

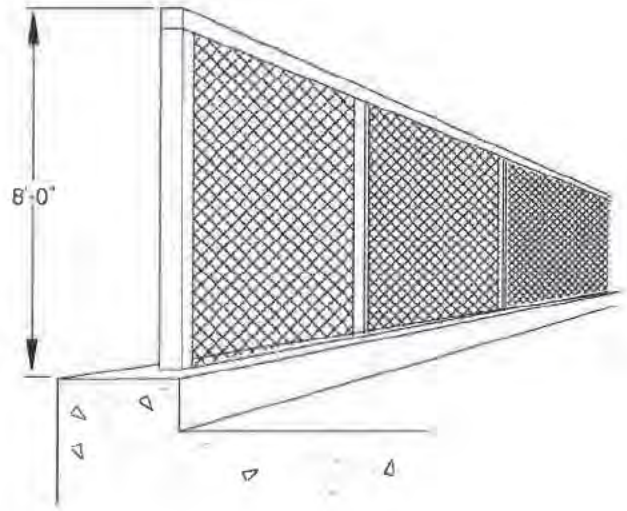


TYPE 732SW WITH TUBULAR HAND RAILING

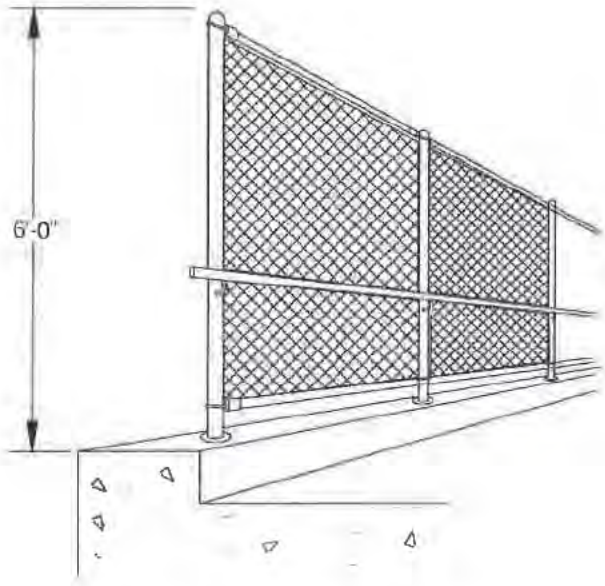
Figure 208.10C
Pedestrian Railings for Bridge Structures



CHAIN LINK RAILING TYPE 3



CHAIN LINK RAILING TYPE 7 (MODIFIED)



CHAIN LINK RAILING

(2) *Foundations and Embankment Design.* Overall performance of the highway approach to the bridge depends, to a significant degree, upon the long-term settlement/consolidation of the approach foundation and structure abutment embankment. A design that minimizes this post construction settlement/consolidation is essential. Factors that influence settlement/consolidation include soil types and depths, static and dynamic loads, ground water level, adjacent operations, and changes in any of the above. The PE must follow the foundation and embankment recommendations by the Division of Engineering Services, Geotechnical Services (DES-GS) and District Materials Engineer (DME). The DME and/or DES-GS must approve any deviations from their recommendations including Construction Change Orders (CCO's).

The relative compaction of material within the embankment limits must be at least 95 percent, except for the outer 5 feet of embankment measured horizontally from the side slope (see Figure 208.11A). The DME and/or OSF may recommend using select material, local and/or imported borrow to assure that the compaction requirements are met and that shrink/swell problems are avoided. They may also recommend a height and duration of embankment surcharge to accelerate foundation consolidation.

Poor quality material, such as expansive soils, must be precluded from structure abutment embankments unless treated. If sufficient quality roadway excavation material is unavailable for constructing of structure abutment embankments, the designer may specify select material, local borrow, or imported borrow to satisfy the design requirements.

(3) *Abutment Drainage.* Special attention must be given to providing a positive drainage system that minimizes the potential for water damage to the structure approach embankment, see Chapter 870 for further details. The Division of Engineering Services (DES), Structures Design (DES-SD) is responsible for the design of the structure approach drainage system, which includes:

- A geocomposite drain covered with filter fabric placed behind both the abutment wall and wingwalls, as indicated in Figure 208.11B.
- A slotted plastic pipe drain, encapsulated with treated permeable material, placed along the base of the inside face of the abutment wall as illustrated in Figure 208.11B.

(4) *Slope Treatment.* See Topic 707, Slope Treatment Under Structures, for guidance regarding the treatment of bridge approach end slopes.

The District Hydraulic Engineer or Project Engineer must design a pipe outlet that ties into the structure approach drainage system as it exits the structure. A pipe outlet system should carry the collected water to a location where it will not cause erosion. Storm Water Best Management Practices should be incorporated. For further information on Storm Water Management, visit the Division of Design Storm Water website.

Coordination with DES is necessary for the exit location of the pipe system. The outlet type should be chosen from the standard edge drain outlet types shown in the Standard Plans or tied into an underground drainage system. The PE must review the drainage design to ensure the adequacy of the drainage ties between the structure approach drainage system and either new or existing drainage facilities. For alternative details, see Bridge Design Aids.

Topic 209 - Structure Approach Slabs

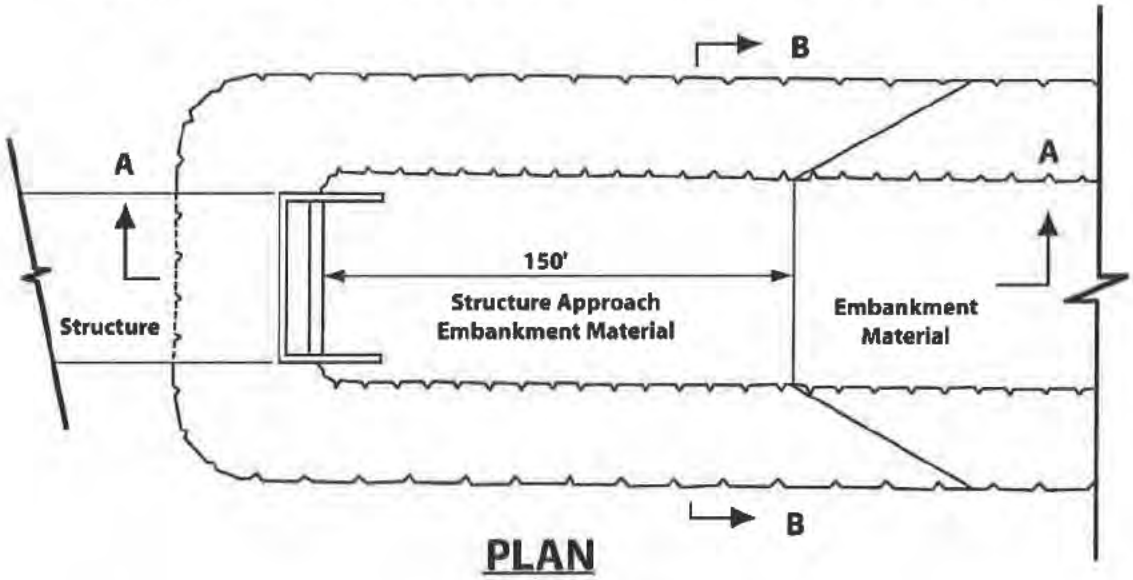
Index 209.1 - Purpose and Application

(1) *Purpose.* The approaches to any structure, new or existing, often present unique geometric, drainage, pavement, and traffic situations that require special considerations.

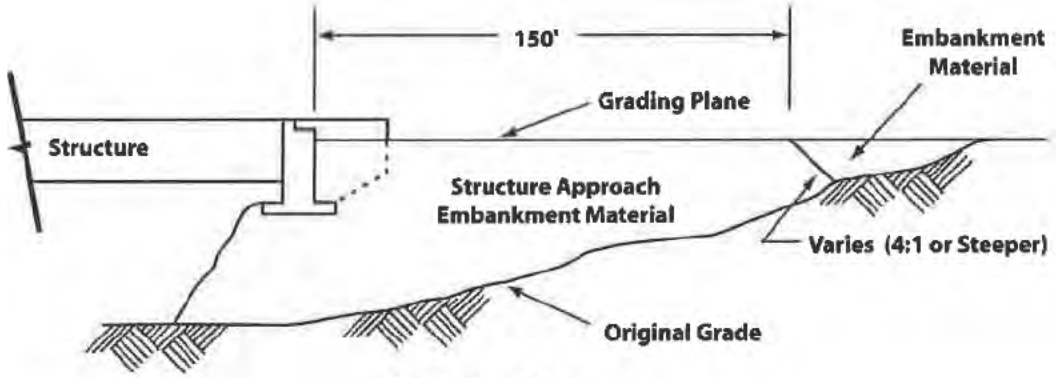
Structure approach slabs provide a smooth transition between a pavement that is generally

Figure 208.11A

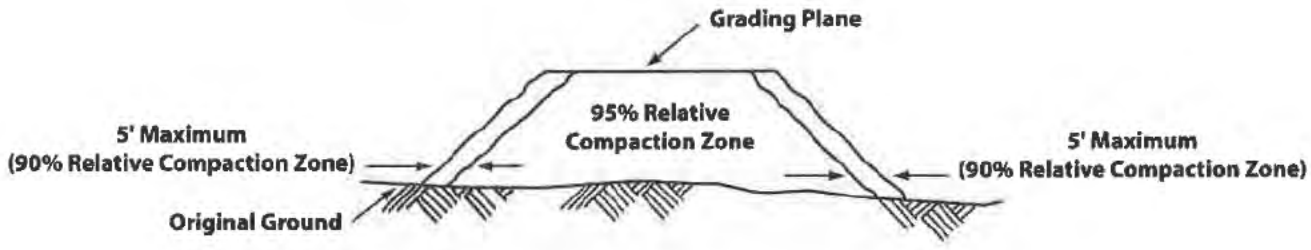
Limits of Structure Approach Embankment Material



PLAN



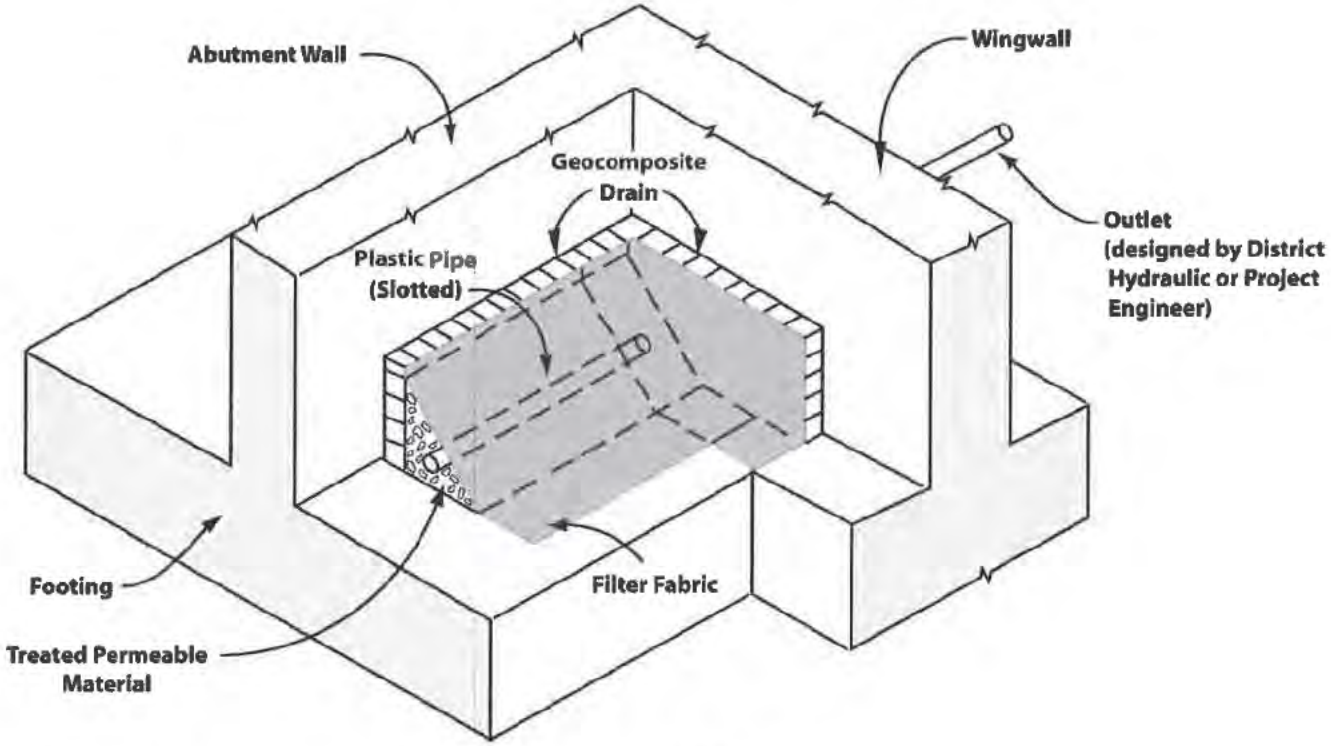
SECTION A-A



SECTION B-B

Figure 208.11B

Abutment Drainage Details



NOTES:

1. **Applicable to new construction only.**
2. **Reference Structures Design Standard Detail XS22-17**
3. **All details shown are designed by the DES except where noted otherwise.**
4. **Outlet may be in wingwall of abutment wall.**

supported on a yielding medium (soil that is subject to consolidation and settlement) and a structure, which is supported on a relatively unyielding foundation (bridge).

These guidelines should be followed in the engineering of all structure approach slab projects involving new construction, reconstruction, widening, preservation, or rehabilitation of structure approaches. They are not, however, a substitute for engineering knowledge, experience, or sound judgment.

(2) *Application.* There are several alternatives that may be considered in the design of a structure approach slab system. These alternatives are designated as Types 45, 30, and 10 structure approach slab systems. Standard details and special provisions for each type of approach slab system can be found on the Structure Design website. Figure 209.1 shows a generic structure approach slab system layout. Structure Design Bridge Memo 5-3 provides the criteria for the selection and design of structure approach slabs. In the event of discrepancies between this manual and Structure Design Bridge Memo 5-3, Memo 5-3 shall govern.

Structure approach slabs extend the full width of the traveled way and shoulders. The Division of Engineering Services (DES) will select the appropriate structure approach slab and provide applicable details, specifications, and an estimate of cost for inclusion in the Plans Specifications and Estimates (PS&E) package. The Project Engineer (PE) must coordinate with structure engineer to assure that the proper structure approach slab is included in the PS&E package.

On new construction projects, overcrossing structures constructed in conjunction with the State highway facility should receive the same considerations as the highway mainline.

209.2 General Considerations

(1) *Field Investigations.* Adequate information must be available early in the project development process if all factors affecting the selection and engineering of a structure approach slab system are to be adequately addressed. A field review will often reveal existing conditions, which must be taken into consideration during the design.

(2) *Load Transfer at Approach Slab/Concrete Pavement Joint.* No matter what structure approach slab alternative is being considered, it is recommended that dowel bars be placed at the transverse joint between the structure approach slab and new rigid pavement to ensure load transfer at the joint. If the structure approach slab is being replaced but the adjacent rigid pavement is not, a dowel bar retrofit is not necessary. The thinner of either the pavement or the structure approach slab will govern placement of the dowel bar at half the thickness of the thinner slab. The standard plans provide other details for transitions from the structure approach slabs to flexible pavement.

(3) *Barriers.* On new construction, the structure approach slab extends laterally to coincide with the edge of structure. Any concrete barriers next to the structure approach slab will therefore need to be placed on top of the structure approach slab are and part of the responsibilities of the structures engineer. The PE should coordinate with structure engineers to coordinate the limits and responsibility for barriers.

(4) *Guardrails.* The extension of the structure approach and sleeper slabs across the full width of the outside shoulder creates a conflict between the outside edge of these slabs and the standard horizontal positioning of some guardrail posts. Consult with district traffic branch if a conflict is encountered. See DES Standard Details and the Standard Plans.

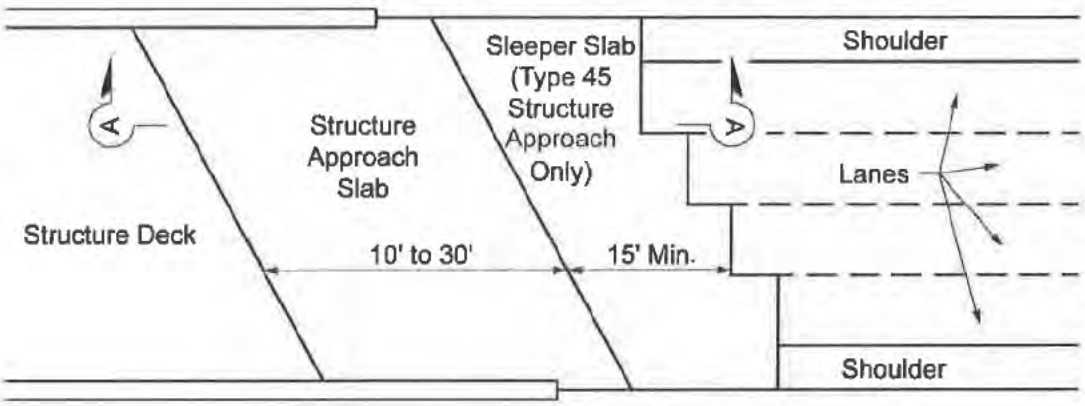
209.3 Structural Approach System Drainage

(1) *Subsurface Drainage.* Figure 209.1 shows the components of the positive structural drainage system. Filter fabric should be placed on the grading plane to minimize contamination of the treated permeable base (TPB) for all types of structure approach systems. The plastic pipe shall have a proper outlet to avoid erosion of

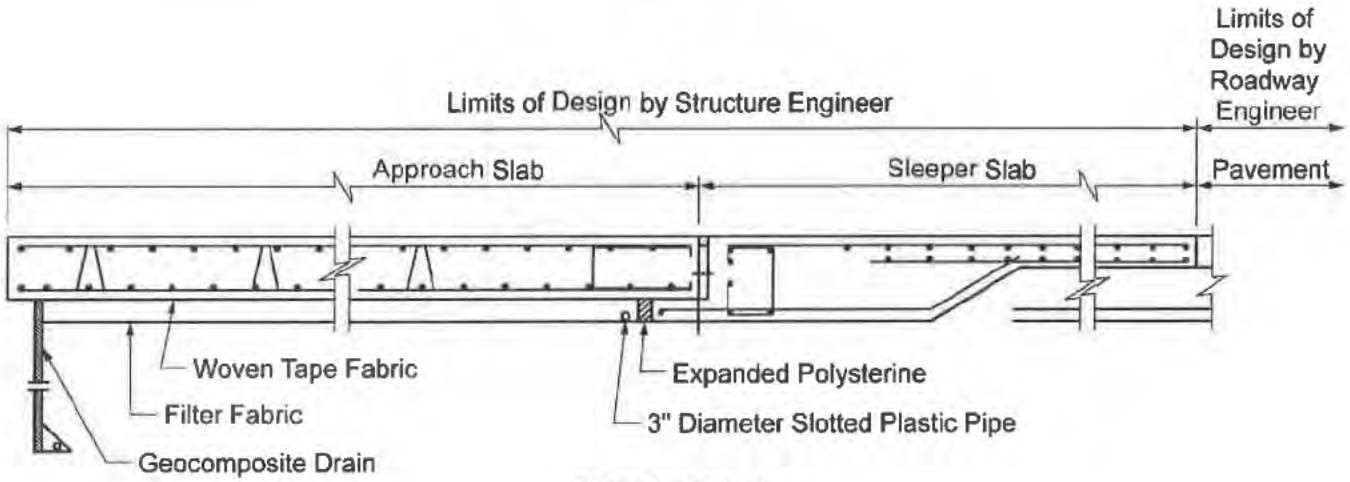
the structure approach embankment. On all new construction projects, regardless of the

Figure 209.1

Structure Approach Slab Layout



PLAN VIEW



SECTION A-A

type of structure approach slab, provisions for positive drainage of the approach system should be incorporated into the design. See Structures Design Standard Details for requirements. The Districts are responsible for all drainage considerations for the roadway while DES Structures is responsible for structure related drainage. The structure engineer is responsible for engineering of both the approach slab and the drainage system, which normally drain through the wingwall. The highway engineer is responsible for engineering the collection and disposal system, which begins on the outside face of the wingwall.

(2) Surface Drainage. Roadway surface drainage should be intercepted before reaching the approach/sleeper slab. The objective is to keep water away from the structure approach embankment. The surface water, once collected, should be discharged at locations where it will not create erosion. Refer to Chapter 831 for more information.

209.4 Structure Approach Slab Rehabilitation Considerations

(1) Approach Slab Replacement. Approach slabs are replaced only when they exhibit sufficient cracking or patching that they are no longer maintainable as is. Structure Maintenance and Investigations (SMI) typically determines when an approach slab warrants replacement. Approach slabs that otherwise experience only rough ride, subsidence, or minor damage are ground, overlaid, or patched as recommended by SMI. Approach slab repairs are typically funded from one of the bridge repair programs in the SHOPP, but can also be funded from another fund program with the agreement of the Headquarters Program Manager for that program when no other bridge work is involved.

Replacement of a structural approach slabs consists of removing the existing pavement, approach slab, underlying base and subsealing material (if applicable) and then replacing with an appropriate type of structure approach system. Depending on the thickness of the existing surface and base layers to be removed, the minimum 1-foot approach slab thickness may have to be increased. The PE needs to make sure the structure engineer addresses this in their reports, plans, and specifications.

(2) Approach Slab Overlays. Asphalt pavement overlays should not be placed on structure decks and approach slabs without the concurrence of Structures Maintenance and Investigations (SMI). If an overlay is needed, SMI will provide the recommended strategy. If another strategy such as polyester concrete is used, either SMI or the Office of Structure Design (OSD) will provide the design details.

(3) Structure Approach Slab Drainage. Typical details for providing positive drainage of a full-width structure approach system are shown in Figure 209.4A. Cross drains are placed at the abutment backwall and at the transverse joint between the existing pavement and the structure approach slab by the structure engineer. A collector/outlet system is placed adjacent to the wingwall at the low side of pavement. The collected water is carried away from the structure approach slab at a location where it will not cause erosion. The PE is responsible for the engineering of the outlet for the structure approach slab drainage. Storm Water Best Management Practices should be considered.

Storm water guidelines are available on the Division of Design, Storm Water website.

The structure approach slab edge details to prevent entry of water at the barrier rail face apply when the wingwalls and/or bridge barrier railing are not being reconstructed.

(4) *Transition Details with Pavement Overlays.* Modification to structure approach slab thicknesses are advantageous when structure approach slabs will be replaced in conjunction with a pavement overlay strategy to promote a smooth transition between structure and pavement. Figure 209.4B, which is applicable to full-width slab replacement, illustrates a method of transitioning from an asphalt overlay thickness to a structure approach slab by tapering the thickness of the structure approach

Figure 209.4A
Structure Approach Drainage Details (Rehabilitation)

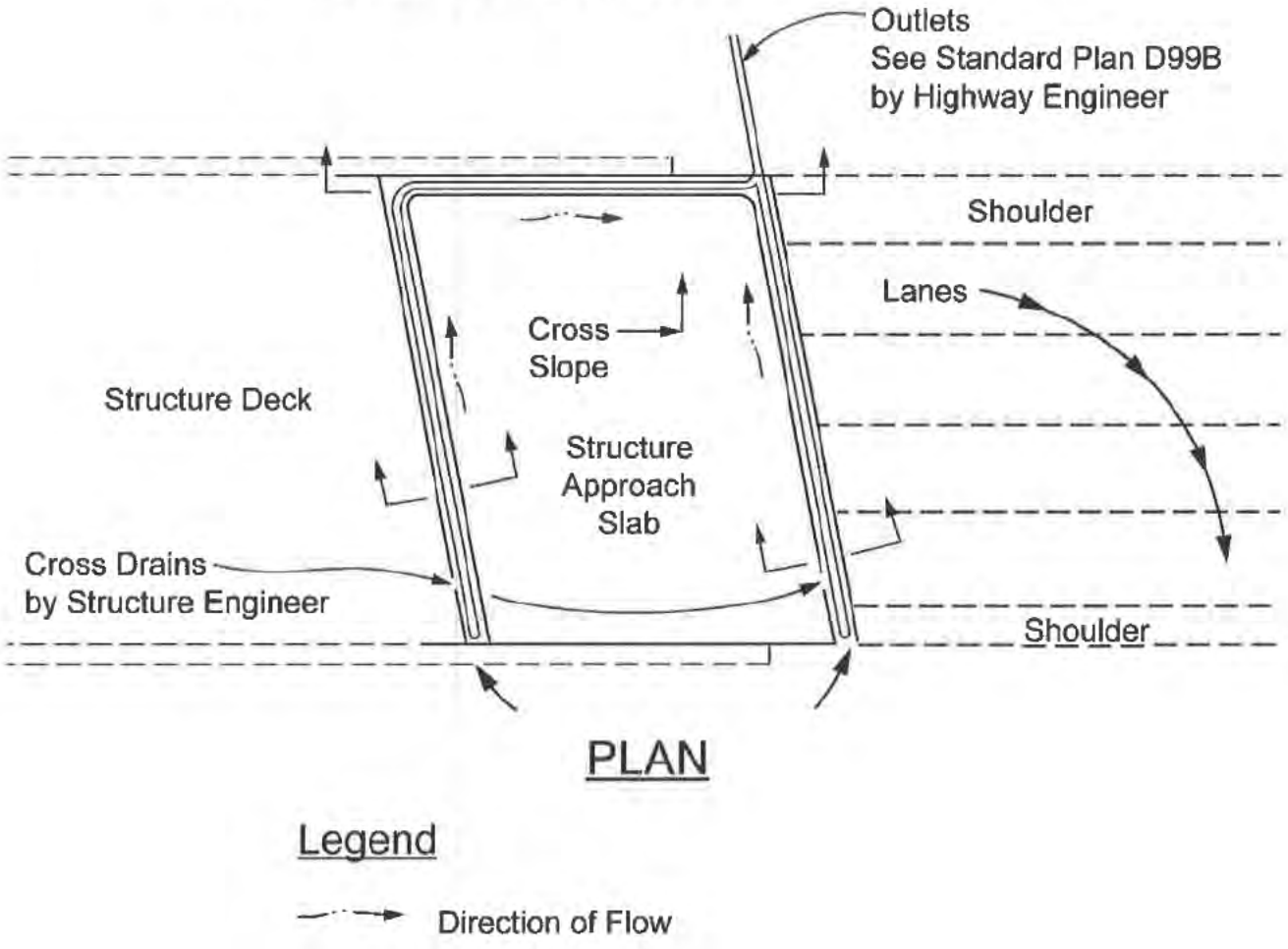
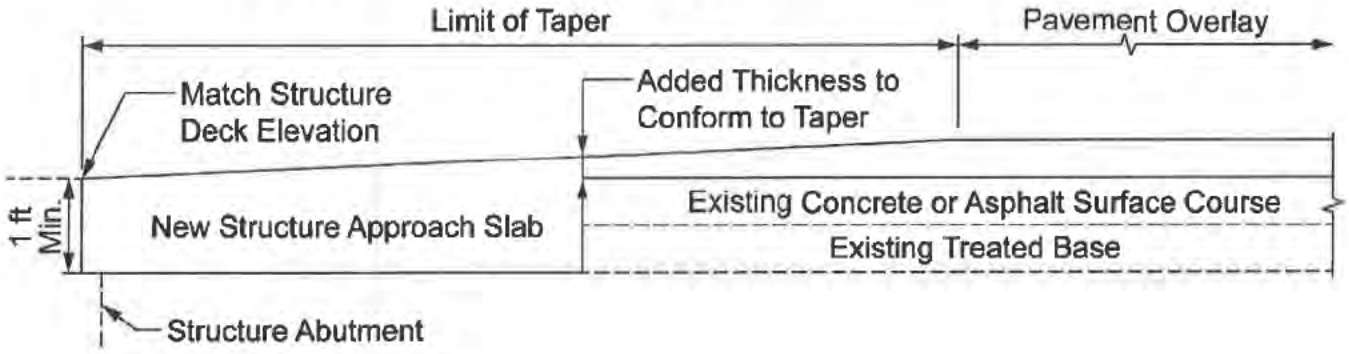


Figure 209.4B
New Structure Approach Pavement Transition Details



slab. Care should be taken in areas with flat grades to avoid creating a ponding condition at the structure abutment.

(5) Traffic Handling. Traffic handling considerations typically preclude full-width construction procedures. Structure approach rehabilitation is therefore usually done under traffic control conditions, which require partial-width construction.

District Division of Traffic Operations should be consulted for guidance on lane closures and traffic handling.

When developing traffic handling plans for structure approach slabs, where replacing markings is necessary, and where there is a need to maintain traffic during construction, the engineer should be aware that pavement joints should not be located underneath any of the wheel paths.

Topic 210 - Reinforced Earth Slopes and Earth Retaining Systems

210.1 Introduction

Constructing roadways on new alignments, widening roadways on an existing alignment, or repairing earth slopes damaged by landslides are situations that may require the use of reinforced earth slopes or earth retaining systems. Using cut and embankment slopes that are configured at slope ratios that are stable without using reinforcement is usually preferred; however, topography, environmental concerns, and right of way (R/W) limitations may require the need for reinforced earth slopes or an earth retaining system.

The need for reinforced earth slopes or an earth retaining system should be identified as early in the project development process as possible, preferably during the Project Initiation Document (PID) phase.

210.2 Construction Methods and Types

(1) Construction Methods

Both reinforced earth slopes and earth retaining systems can be classified by the method in which they are constructed, either top-down or bottom-up.

- "Top-down" construction – This method of construction begins at the top of the reinforced slope or earth retaining system and proceeds in lifts to the bottom of the reinforced slope or earth retaining system.

  If required, reinforcement is inserted into the in situ material during excavation.

- "Bottom-up" construction – This method of construction begins at the bottom of the reinforced slope or earth retaining system, where a footing/leveling pad is constructed, construction then proceeds towards the top of the reinforced slope or earth retaining system. If required, reinforcement is placed behind the face of the reinforced slope or earth retaining system. It should be noted that if a "Retaining Wall" earth retaining system is to be used in a cut situation, a temporary back cut or shoring system is required behind the wall.

The District Project Engineer (PE) should conduct an initial site visit and assessment to determine all potential construction limitations. The preferred construction method is top-down due to the reduced shoring, excavation and backfilling. However, this method is not always available or appropriate based on the physical and geotechnical site conditions. The site should also be examined for R/W or utility constraints that would restrict the type of excavation or limit the use of some equipment. In addition, the accessibility to the site for construction and contractor staging areas should be considered.

Table 210.2 summarizes the various reinforced earth slopes and earth retaining systems that are currently available for use, along with the method in which they are constructed.

Table 210.2
Types of Reinforced Earth Slopes and Earth Retaining Systems[1]

EARTH RETAINING SYSTEM	Construction Method[2]	PS&E By	Typical Facing Material	Recommended Maximum Vertical Height, ft	Ability to Tolerate Differential Settlement[3]
Reinforced Earth Slopes					
Reinforced Embankments	BU	District PE	Vegetation/Soil	160	E
Rock/Soil Anchors	TD	District PE	Soil/Rock	130	E
State Designed Earth Retaining Systems with Standard Plans					
Concrete Cantilever Wall, Type 1 & 1A	BU	District PE	Concrete	36, 12, 22[4]	P
Concrete L-Type Cantilever Wall, Type 5	BU	District PE	Concrete	12[4]	P
Concrete Masonry Wall, Type 6	BU	District PE	Masonry	6[4]	P
Crib Wall: Concrete, Steel	BU	District PE	Concrete, Steel	50, 36, [4]	P
State Designed Earth Retaining Systems Which Require Special Designs					
Standard Plan Walls with modified wall geometry, foundations or loading conditions	BU	Structure PE	Concrete, Steel, Timber	50	P-F
Non-Gravity Cantilevered Walls					
Sheet Pile Wall	TD	Structure PE	Steel	20	F
Soldier Pile Wall with Lagging	TD/BU	Structure PE	Concrete, Steel, Timber	20	F-G
Tangent Soldier Pile Wall	TD/BU	Structure PE	Concrete	30	F
Secant Soldier Pile Wall	TD	Structure PE	Concrete	30	F
Slurry Diaphragm Wall	TD	Structure PE	Concrete, Shotcrete	80[5]	F
Deep Soil Mixing Wall	TD	Structure PE	Shotcrete	80[5]	F-G
Anchored Wall (Structural or Ground Anchors)	TD	Structure PE	Concrete, Steel, Timber	80[6]	F-G
Gravity Walls					
Concrete Gravity Wall	BU	Structure PE	Concrete	6	P
Rock Gravity Wall	BU	District PE	Rock	13	E
Gabion Basket Wall	BU	District PE	Wire & Rock	26	E
Soil Reinforcement Systems					
Mechanically Stabilized Embankment	BU	Structure PE	Concrete	50	G
Salvaged Material Retaining Wall	BU	District PE	Steel, Timber	16	G
Soil Nail Wall	TD	Structure PE	Concrete, Shotcrete	80	F
Tire Anchored Timber Wall	BU	District PE	Timber	32	G
Proprietary Earth Retaining Systems (Pre-approved)					
The list of Pre-approved systems is available at the website shown in Index 210.2(3)(c).					
Proprietary Earth Retaining Systems (Pending)					
These systems are under review by DES-SD. For more information, see Index 210.2(3)(d).					
Experimental State Designed Earth Retaining Systems					
Geosynthetic Reinforced Walls	BU	Structure PE/ District PE	Concrete Blocks, Steel, Vegetation, Fabric	65	E
Mortarless Concrete Blocks Gravity Walls	BU	District PE	Concrete Blocks	8	P

NOTES:
1. Comparative cost data is available from DES-SD.
2. BU = Bottom Up; TD = Top Down
3. E = Excellent; G = Good; F = Fair; P = Poor
4. Maximum Design Height
5. Anchors may be required
6. With lagging

(2) Reinforced Earth Slopes (PS&E by District PE)

Reinforced earth slopes incorporate metallic or non-metallic reinforcement in construction of embankments and cut slopes with a slope angle flatter than 70 degrees from the horizontal plane. Reinforced earth slopes should be used in conjunction with erosion mitigation measures to minimize future maintenance costs. The slope face is typically erosion protected with the use of systems such as geosynthetics, bio-stabilization, rock slope protection, or reinforced concrete facing.

(3) Earth Retaining Systems

Earth retaining systems can be divided into five major categories depending upon the nature of the design and whether they are designed by the owner (State designed), a Proprietary vendor or a combination thereof. The term "State designed" as referenced herein is utilized to encompass earth retaining systems that are designed by the State or by Local or Private entities on behalf of the State.

No assignment of roles and responsibilities is intended. The five categories are as follows:

(a) State Designed Earth Retaining Systems which utilize Standard Plans (PS&E by District PE).

Standard Plans are available for a variety of earth retaining systems (retaining walls). Loading conditions and foundation requirements are as shown on the Standard Plans. For sites with requirements that are not covered by the Standard Plans, a special design is required. To assure conformance with the specific Standard Plan conditions and requirements, and subsequent completion of the PS&E in a timely fashion, the District PE should request a foundation investigation for each location where a retaining wall is being considered. Retaining walls that utilize Standard Plans are as follows:

- Retaining Wall Types 1 and 1A (Concrete Cantilever). These walls have design heights up to 36 feet and 12 feet respectively, but are most economical below 20 feet. Concrete cantilever walls can accommodate traffic barriers, and drainage facilities efficiently. See Standard Plans for further details.

Retaining Wall Type 5 (Concrete L-Type Cantilever). This wall has a design height up to 12 feet. Although more costly than cantilever walls, these walls may be required where site restrictions do not allow for a footing projection beyond the face of the wall stem. See Standard Plans for further details.

Retaining Wall Type 6 (Concrete Masonry Walls). These walls may be used where the design height of the wall does not exceed 6 feet. These walls are generally less costly than all other standard design walls or gravity walls. Where traffic is adjacent to the top of the wall, guardrail should be set back as noted in the Standard Plans. See Standard Plans or further details.

- Crib Walls. The following types are available:

Concrete Crib Wall - This type of crib wall may be used for design heights up to 50 feet. Concrete crib walls are suited to coastal areas and higher elevations where salt air and deicing salts may limit the service life of other types of crib walls. See Standard Plans or further details.

Steel Crib Wall - This type of crib wall may be used for design heights up to 36 feet. Steel crib walls are light in weight; easily transported and installed; and, therefore, suited for relatively inaccessible installations and for emergency repairs. See Standard Plans for further details.

Concrete crib walls constructed on horizontal alignments with curves or angle points require special details, particularly when the wall face is battered. Because crib wall faces can be climbed, they are not recommended for use in urban locations where they may be accessible to the public.

(b) State Designed Earth Retaining Systems which requires Special Designs.

Some locations will require a special design to accommodate ground contours, traffic, utilities, man-made features, site geology, economics, or aesthetics.

Some special design earth retaining systems are as follows:

- Standard Plan Walls (PS&E by Structure PE). The design loadings, heights, and types of walls in the Standard Plans cover frequent applications for earth retaining systems. However, special designs are necessary if the imposed loading exceeds that shown on the Standard Plan. Railroad live loads; building surcharge; loads imposed by sign structures, electroliers, or noise barriers are examples of loading conditions that will require special designs. Foundation conditions that require pile support for the wall and angle points in the wall geometry necessitate a special design.
- Non-Gravity Cantilevered Walls (PS&E by Structure PE). These walls include sheet pile walls, soldier pile walls with lagging, tangent soldier pile walls, secant soldier pile walls, slurry diaphragm walls, and deep soil mixing walls. These walls are most practical in cut sections and are best suited for situations where excavation for a retaining wall with a footing is impractical because of traffic, utilities, existing buildings, or R/W restrictions. In embankment sections, a non-gravity cantilevered wall is a practical solution for a roadway widening where design heights are less than 15 feet. They are also practical for slip-out corrections. Non-gravity cantilevered walls can consist of concrete, steel, timber, or cemented soil piles that may be either driven into place or placed in drilled holes and trenches.
- Anchored Walls (PS&E by Structure PE). These walls are typically composed of the same elements as non-gravity cantilevered walls, but derive additional lateral resistance from ground anchors (tiebacks), concrete anchors, or pile anchors. These anchors are located behind the potential failure surfaces in the retained soil and are connected to the wall structurally. The method of support and anchorage depends on site conditions, design height, and loading imposed. The cost of these walls is variable depending on earth retaining requirements, site geology, aesthetic consideration, and site restraints, but is generally higher than "Standard Design Walls" for the same wall geometry and loading conditions. Anchored walls may be used to stabilize an unstable site provided that adequate material exists at the site for the anchors. Economical wall heights up to 80 feet are feasible.
- Gravity Wall Systems that require special designs are Concrete Gravity, Rock Gravity, and Gabion Basket Walls. Concrete Gravity Walls (PS&E by Structure PE). Concrete gravity walls are most economical at design heights below 4 feet. However, they may be constructed at heights up to 6 feet. These walls can be used in connection with a cantilever wall if long lengths of wall with design heights of less than 4 feet are required.
- Rock Gravity Walls (PS&E by District PE). Rock gravity walls consist of rocks that are 100 pounds to 200 pounds, stacked on top of each other at slight batter. These walls are typically used in areas where a rock appearance is desirable for aesthetic reasons. Wall heights range from 1 foot 6 inches to 15 feet, but are most economical for heights less than 10 feet.

- Gabion Basket Walls (PS&E by District PE). Gabion basket walls use compartmented units filled with stones and can be constructed up to 26 feet in height. Each unit is a rectangular basket made of galvanized steel wire. The stone fill is 4 inches to 16 inches in size. Gabion basket walls are typically used for soil and stream bank stabilization. Service life of the gabion basket wall is highly dependent on the environment in which they are placed. Corrosion, abrasion, rock impact, fire and vandalism are examples of site-specific factors that would influence the service life of the wall and should be taken into consideration by the District PE during the design of the project. See Standard Plans for further details.

- Soil Reinforcement Systems. Soil reinforcement systems consist of facing elements and soil reinforcing elements incorporated into a compacted or in situ soil mass. The reinforced soil mass functions similar to a gravity wall.

  Soil reinforcing elements can be any material that provides tensile strength and pullout resistance, and possesses satisfactory creep characteristics and service life. Generally, reinforcing elements are steel, but polymeric and fiberglass systems may be used.

  Facing elements for most systems are either reinforced concrete, light gauge steel, or treated wood. Polymeric reinforced walls may be faced with masonry-like elements or even planted with local vegetation. Selection of facing type is governed by aesthetics and service life.

  Special details are required when drainage structures, overhead sign supports or noise barriers on piles are within the reinforced soil mass. Concrete traffic barriers require a special design support slab when used at the top of the facing of these systems. These systems cannot be used where site restrictions do not allow necessary excavation or placement of the soil reinforcing elements.

  Soil reinforcement systems that require special design are as follows:

- Mechanically Stabilized Embankment (MSE) (PS&E by Structure PE). This system uses welded steel wire mats, steel strips or polymeric materials as soil reinforcing elements. The facing elements are precast concrete. In many cases, this system can be constructed using on-site backfill materials.

  When the bottom-up construction method is possible and other conditions permit their use, these systems are generally the most economical choice for wall heights greater than 20 feet. They may also be the most economical system for wall heights in the 10-foot to 20-foot range, depending on the specific project requirements.

  Because of the articulated nature of the facing elements these systems use, they can tolerate greater differential settlement than can monolithic conventional rigid retaining walls, such as concrete cantilever retaining walls.

  Steel elements used in this method are sized to provide sacrificial steel to compensate for anticipated corrosion; and may be galvanized to provide additional protection.

- Salvaged Material Retaining Wall (PS&E by District PE). This system utilizes C-channel sections as soil reinforcement. Galvanized guardrail elements, timber posts or concrete panels are used as facing elements. Often these materials can be salvaged from projects. The District Recycle

Coordinator should be consulted as to the availability of salvaged materials.

- Soil Nail Wall (PS&E by Structure PE). This system reinforces either the original ground or an existing embankment during the excavation process. Soil nailing is always accomplished from the top-down in stages that are typically 4 feet to 6 feet in height. After each stage of excavation, corrosion protected soil reinforcing elements, "soil nails", are placed and grouted into holes which have been drilled at angles into the in situ material. The face of each stage of excavation is protected by a layer of reinforced shotcrete. After the full height of wall has been excavated and reinforced, a finish layer of concrete facing is placed either by the shotcreting method or by casting within a face form.

  When top-down construction is possible and conditions permit its use, soil nail wall systems are generally the most economical choice for wall heights greater than 10 feet. Wall heights in excess of 80 feet are feasible in specific locations.

  Because soil nailing is accomplished concurrent with excavation, and thus results in an unloading of the foundation, there is typically no significant differential settlement.

  Steel "soil nails" used in this method are protected against corrosion either by being epoxy coated or encapsulated within a grout filled corrugated plastic sheath, and surrounded by portland cement grout placed during construction. Soil nail lengths typically range from 80 to 100 percent of the wall height, the actual length depends on the nail spacing used and the competency of the in situ soil.

- Recycled Tire Anchor Timber (TAT) Walls (PS&E by District PE). This system utilizes steel bars with recycled tire sidewalls attached by cross bars as soil reinforcing elements. The facing elements are treated timber. TAT walls have a rustic appearance, which makes them suitable in rural environments. The length of commercially available timber post generally controls the height of wall but heights up to 32 feet are feasible.

(c) Proprietary Earth Retaining Systems (Pre-approved).

These conventional retaining walls, cribwalls, and soil reinforcement systems are designed, manufactured, and marketed by vendors. These systems are termed "proprietary" because they are patented. "Pre-approval" status means that these systems may be listed in the Special Provisions of the project as an Alternative Earth Retaining System (AERS), see Index 210.3, when considered appropriate for a particular location. For a proprietary system to be given "pre-approval" status, the vendor must submit standard plans and design calculations to the Division of Engineering Services – Structure Design (DES-SD) for their review and approval. The Proprietary earth retaining systems that have been pre-approved are included in the Department's Authorized Material List, located on the following website: http://www.dot.ca.gov/aml/.

Design details and specifications of "pre-approved" proprietary earth retaining systems may be found on the vendor websites listed in the Authorized Material List. New systems are added to the website list once they are pre-approved for use.

(d) Proprietary Earth Retaining Systems (Pending).

The systems in this category have been submitted by vendors to DES-SD for evaluation. Upon approval of DES-SD, pending systems are added to the website list of "pre-approved" proprietary earth retaining systems and included in the project specific Special Provisions.

If a proprietary system is the only retaining system deemed appropriate for use at a specific location, the construction of that system must be justified or designated an experimental construction feature in accordance with existing Departmental Policy concerning sole source purchases. See Index 110.10 for additional guidance on the use of proprietary items.

(e) Experimental State Designed Earth Retaining Systems.

Every earth retaining system is evaluated before being approved for routine use by the Department. Newly introduced designs, unproven combinations of proprietary and non-proprietary designs or products, are considered experimental. Once an experimental system has been evaluated and approved, it will be made available for routine use. The use of these systems is only permitted upon consultation with the Division of Engineering Services – Geotechnical Services (DES-GS).

Some earth retaining systems which are currently considered experimental follow:

- Geosynthetic Reinforced Walls (PS&E by District PE). These systems utilize geosynthetic material as the soil reinforcing elements. The face of these walls can be left exposed if the geosynthetic material has been treated to prevent decay from ultra-violet rays. Concrete panels, mortarless masonry, tar emulsion, or air blown mortar may be used as facing materials or the face may be seeded if a more aesthetic treatment is preferred. Design is by DES-GS.
- Mortarless Concrete Block Gravity Walls (PS&E by District PE). These wall types consist of vertically stacked, dry cast, concrete blocks. This system utilizes the friction and shear developed between the blocks and the combined weight of the blocks to retain the backfill. Some of these walls have been used as erosion protection at abutments and on embankments. They can be used as an aesthetic treatment for geosynthetic material reinforced walls. All of these walls require a batter. Design is by the DES-GS.

210.3 Alternative Earth Retaining Systems (AERS)

Using the Alternative Earth Retaining Systems (AERS) procedure encourages competitive bidding and potentially results in project cost savings. Therefore, AERS must be considered in all projects where earth retaining systems are required.

The AERS procedure may result in one or more earth retaining systems being included in the contract bid package. Under this procedure, a fully detailed State designed earth retaining system will be provided for each location, and will be used as the basis for payment. Additional systems may be presented in the contract documents as alternatives to the fully detailed State design and can be considered for use at specified locations. The fully detailed State designed earth retaining system may be either a Standard Plan system or a special design system. Alternative systems may also be State designed systems, "pre-approved" proprietary systems or experimental systems, as appropriate. The State designed alternative systems, both Standard Plan walls and special design systems, are to be completely designed and specified in the PS&E. Alternative systems are to be listed in the Special Provisions as AERS.

The AERS procedure requires the involvement of the District PE, DES-SD, and the DES-GS. The District PE should submit pertinent site information (site plans, typical sections, etc.) to DES-GS for a feasibility study as early as possible in the project development process.

Under the AERS procedure, parts of the PS&E package which pertain to the earth retaining systems will be prepared as follows:

- Contract plans for State designed systems can be prepared by the District PE (Standard Plan systems), the DES-GS (special design soil reinforcement systems and experimental systems), or the Structure PE (Standard Plan systems and special design systems).

- "Pre-approved" proprietary systems that are determined, based on consultation with DES-SD, to be appropriate alternatives to the State designed earth retaining system, are to be listed in the Special Provisions.
- Specifications and Estimates shall be developed for the fully detailed State designed system, which will be used as the basis for payment.

The earth retaining systems utilizing this procedure are to be measured and paid for by the square yard area of the face of the earth retaining system. Should an AERS be constructed, payment will be made based on the measurements of the State designed system which was designated as the basis of payment. The contract price paid per square yard is for all items of work involved and includes excavation, backfill, drainage system, reinforcing steel, concrete, soil reinforcement, and facing. Any barrier, fence, or railing involved is measured and paid for as separate contract cost items.

210.4 Value Engineering Change Proposal (VECP)

Sometimes Contractors submit proposals for an earth retaining system under Section 4-1.07 of the Standard Specifications, "Value Engineering." The Contractor proposed system may modify or replace the earth retaining system permitted by the contract. The VECP process allows vendors of proprietary earth retaining systems an alternative method for having their systems used prior to obtaining "pre-approval" (see Index 210.2(3)(c)). VECP submittals are administered by the Resident Engineer. However, Contract Change Orders are not to be processed until the VECP is approved by Headquarters Construction with review assistance provided by the District or Structure PE as appropriate.

210.5 Aesthetic Consideration

The profile of the top of wall should be designed to be as pleasing as the site conditions permit. All changes in the slope at the top of cast-in-place concrete walls should be rounded with vertical curves at least 20 feet in length. Abrupt changes in the top of the wall profile should be avoided by using vertical curves, slopes, steps, or combinations thereof. Side slopes may be flattened or other adjustments made to provide a pleasing profile.

Where walls are highly visible, special surface treatments or provisions for landscaping should be considered. The aesthetic treatment of walls should be discussed with the District Landscape Architect and when necessary referred to DES Structure Design Services for additional study by the Office of Transportation Architecture.

The wall area between the grade line and 6 feet above it shall be free of any designed indentations or protrusions that may snag errant vehicles.

When alternative wall types are provided on projects with more than one wall site, any restrictions as to the combination of wall types should be specified in the Special Provisions.

210.6 Safety Railing, Fences, and Concrete Barriers

Cable railing should be installed for employee protection in areas where employees may work adjacent to and above vertical faces of retaining walls, wingwalls, abutments, etc. where the vertical fall is 4 feet or more.

If cable railing is required on a wall which is less than 4 feet 6 inches tall and that wall is located within the clear recovery zone, then the cable railing should be placed behind the wall. See Standard Plan B11-47 for details of cable railing.

Special designs for safety railing may be considered where aesthetic values of the area warrant special treatment. In addition, if the retaining wall is accessible to the public and will have pedestrians or bicycles either above or below the retaining wall, then the provisions of Index 208.10 shall apply.

Concrete barriers may be mounted on top of retaining walls. Details for concrete barriers mounted on top of retaining walls Type 1 through 5 are shown in the Standard Plans. A concrete barrier slab is required if a concrete barrier is to be used at the top of a special design earth retaining system. DES-SD should be contacted for preparation of the plans involved in the special design.

Retaining walls joining right of way fences should be a minimum of 6 feet clear height.

The District PE should examine the proposed retaining wall location in relation to the provisions of Index 309.1 to ensure adequate horizontal clearances to the structure or to determine the type

and placement of the appropriate roadside safety devices.

210.7 Design Responsibility

The Structure PE has primary responsibility for the structural design and preparation of the contract documents (PS&E) for special design earth retaining systems involving Standard Plans non-gravity cantilevered walls, anchored walls, concrete and rock gravity walls, mechanically stabilized embankment, and soil nail walls. The DES-GS has primary responsibility for the geotechnical design of all reinforced earth slopes and earth retaining systems. DES-SD will prepare the Specifications and Engineer's Estimate for contracts when the AERS procedure is used. DES-SD reviews and approves standard plan submittals for proprietary earth retaining systems submitted by vendors. DES-SD and DES-GS assist Headquarters Construction in evaluating the VECP submitted by contractors.

Districts may prepare contract plans, specifications, and engineer's estimate for Standard Plan retaining walls provided the foundation conditions and site requirements permit their use. A foundation investigation is required for all reinforced earth slopes and earth retaining systems. PS&E's for slurry walls, deep soil mixing walls, gabion walls, tire anchored timber walls, salvaged material walls, and experimental walls will be prepared by the District PE with assistance from DES-GS. Earth retaining systems may be included in the PS&E as either highway or structure items.

The time required for DES-SD to provide the special design of a retaining system is site and project dependent. Therefore, the request for a special design should be submitted by the District PE to DES-SD as far in advance as possible, but not less than 6 months prior to PS&E delivery. At least 3 months is required to conduct a foundation investigation for an earth retaining system. A site plan, index map, cross sections, vertical and horizontal alignment, and utility and drainage requirements should be sent along with the request.

DES-GS has the responsibility for preparing a feasibility study for AERS. The District PE should submit project site information (site plans, typical sections, etc.) as early in the planning stage as possible so that determination of the most appropriate earth retaining system to use can be made.

210.8 Guidelines for Type Selection and Plan Preparation

(1) Type Selection. Type selection for reinforced earth slopes and earth retaining systems should be based on considerations set forth in Index 210.2.

The District PE should request a feasibility study for a reinforced slope or earth retaining system from DES-GS as early as possible in the project development process. After the feasibility study, the District PE should request an Advanced Planning Study (APS) from DES-SD for all special design earth retaining systems that DES-SD may be required to include in the PS&E.

If the District PE decides that the course of action favors an earth retaining system in which the PS&E will be delivered by DES-SD, then a Bridge Site Data Submittal – Non-Standard Retaining Wall/Noise Barrier must be submitted to DES-Structure Design Services & Earthquake Engineering – Preliminary Investigations (PI) Branch. A copy of this submittal will be forwarded to DES-SD and DES-GS by PI.

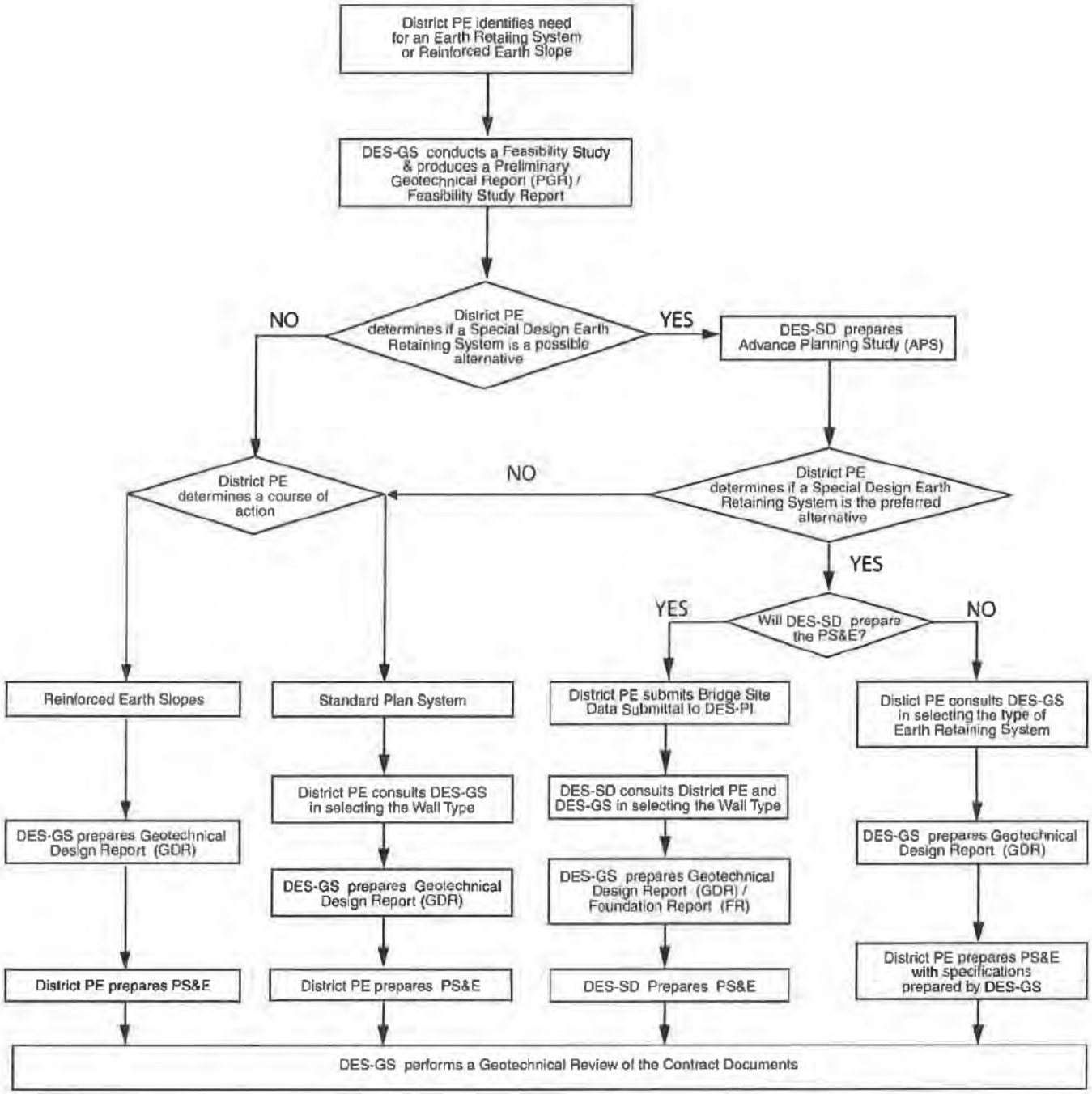
The Structure PE, with input from DES-GS and the District PE, will then type select the appropriate earth retaining system for the site and project. After an earth retaining system has been type selected, then DES-GS will prepare a Geotechnical Design Report.

The process for type selecting and developing the PS&E for reinforced earth slopes and earth retaining systems is set forth in Figure 210.8.

All appropriate State designed and proprietary earth retaining systems should be considered for inclusion in the contract documents to promote competitive bidding, which can result in cost savings.

(2) Foundation Investigations. DES-GS should be requested to provide a foundation recommendation for all sites involving a reinforced slope or an earth retaining system. Any log of test boring sheets accompanying the

Figure 210.8
Type Selection and PS&E Process for Reinforced Earth Slopes and Earth Retaining Systems



foundation reports must be included with the contract plans as project information, for the bidders use.

(3) *Earth Retaining Systems with Standard Plans.* The following guidelines should be used to prepare the contract plans for earth retaining systems, which are found in the Standard Plans:

(a) Loads. All wall types selected must be capable of supporting the field surcharge conditions. The design surcharges can be found in the Standard Plans. Deviance from these loadings will require a special design

(b) Footing Steps. For economy and ease of construction of wall Types 1 through 6, the following criteria should be used for layout of footing steps.

- Distance between steps should be in multiples of 8 feet.
- A minimum number of steps should be used even if a slightly higher wall is necessary. Small steps, less than 1 foot in height, should be avoided unless the distance between steps is 96 feet or more. The maximum height of steps should be held to 4 feet. If the footing thickness changes between steps, the bottom of footing elevation should be adjusted so that the top of footing remains at the same elevation.

(c) Sloping Footings. The following criteria should be used for layout of sloping footings.

- The maximum permissible slope for reinforced concrete retaining walls is 3 percent. Maximum footing slope for masonry walls is 2 percent.
- When sloping footings are used, form and joint lines are permitted to be perpendicular and parallel to the footing for ease of construction.
- In cases where vertical electroliers or fence posts are required on top of a wall, the form and joint lines must also be vertical. A sloping footing should not be used in this situation since efficiency of construction would be lost.

Sloping footing grades should be constant for the entire length of the wall. Breaks in footing grade will complicate forming and result in loss of economy. If breaks in footing grade are necessary, a level stepped footing should be used for the entire wall.

- When the top of wall profile of crib walls is constant for the entire length, the bottom of wall profile may be sloped to avoid steps in the top of wall. In this case, all steps to compensate for changes of wall height and original ground profile would be made in the bottom of wall. The maximum permissible slope is 6 percent. If vertical electroliers or fence posts are required on top of the wall, the crib wall should not be sloped. Sloping crib walls are permissible with guard railing with vertical posts.

(d) Wall Joints. General details for required wall joints on wall Types 1, 1A, 2, and 5 are shown on Standard Plan B0-3. Expansion joints, Bridge Detail 3-3, should be shown at maximum intervals of 96 feet. Shorter spaces should be in multiples of 8 feet. Expansion joints generally should be placed near angle points in the wall alignment. When concrete barriers are used on top of retaining walls, the waterstop in the expansion joint must be extended 6 inches into the barrier. This detail should be shown or noted on the wall plans. Weakened plane joints, Bridge Detail 3-2, should be shown at nearly equal spaces between joints.

(e) Drainage. Gutters should be used behind walls in areas where it is necessary to carry off surface water or to prevent scour. Low points in wall vertical alignment or areas between return walls must be drained by downspouts passing through the walls. Standard Plan B3-9 shows typical drainage details. Special design of surface water drainage facilities may be necessary

depending on the amount of surface water anticipated. Where ground water is likely to occur in any quantity, special provisions must be made to intercept the flow to prevent inundation of the backfill and unsightly continuous flow through weep holes.

(f) Quantities. When the AERS procedure is not utilized, quantities for each wall item of work are usually developed for payment. The quantities for concrete, expansion joint waterstop, structure excavation, structure backfill, pervious backfill material, concrete barrier or railing, and gutter concrete must also be tabulated. Quantities should be tabulated on the plans for each wall.

(4) Soil Reinforcement Systems. The following guidelines should be used to prepare the contract plans for soil reinforcement systems:

(a) Leveling Pads. Most soil reinforcement systems do not require extensive foundation preparation. It may be necessary, however, to design a concrete leveling pad on which to construct the face elements. A reinforced concrete leveling pad will be required in areas prone to consolidation or frost disturbance.

- Steps in the leveling pad should be the same height as the height of the facing elements or thickness of the soil layer between the soil reinforcement.
- Distance between steps in the leveling pad should be in increments equivalent to the length of individual facing elements.
- A minimum number of steps should be used even if a slightly higher wall is necessary.

(b) Drainage. Gutters should be used behind walls in areas where it is necessary to carry off surface water or to prevent scour. Low points in wall vertical alignment or areas between return walls must be drained by downspouts passing through the walls. Special design of surface water drainage facilities will be necessary and should be prepared by DES-SD. Where ground water is likely to occur in any quantity, special provisions must be made to intercept the flow to prevent inundation of the backfill.

(c) Quantities. When the AERS procedure is not utilized, quantities for each item of work are usually developed for payment. Bid items must include, but not be limited to: excavation and backfill for the embedment depth, soil reinforcement, facing elements, and concrete for leveling pad construction. Additional bid items for inclusion are any drainage system, pervious backfill, concrete barrier, railings, and concrete gutters. Quantities should be tabulated on the plans for each wall.

(5) Earth Retaining Systems. The following miscellaneous details are applicable to all earth retaining systems:

(a) Utilities. Provisions must be made to relocate or otherwise accommodate utilities conflicting with the retaining wall. A utility opening for a Type 1 wall is shown on Standard Plan B3-9. Any other utility openings will require special design details and should be reviewed by DES-SD.

(b) Electroliers and Signs. Details for mounting electroliers and signs on earth retaining systems are designed by DES-SD. Requests for preparation of details should be made at least 3 months in advance of the PS&E submittal to District Officer Engineer date. To accommodate the base plates for overhead signs, a local enlargement may affect the horizontal clearance to both the edge of pavement and the right of way line. This type of enlargement should be considered at the time of establishing the wall layout and a need for a design standard decision document determined. For mounting details, furnish DES-SD a complete cross section of the roadway at the sign and the layout and profile of the earth retaining system.

(c) Fence and Railing Post Pockets. Post pocket details shown for cable railing in the Standard Plans may also be used for mounting chain link fence on top of retaining walls. Special details may be necessary to accommodate the reinforcement in soil reinforcement systems.

(d) Return Walls. Return walls should be considered for use on the ends of the walls to provide a finished appearance. Return walls are necessary when wall offsets are used or when the top of wall is stepped. Return walls for soil reinforcement systems will require special designs to accommodate the overlapping of soil reinforcing elements.

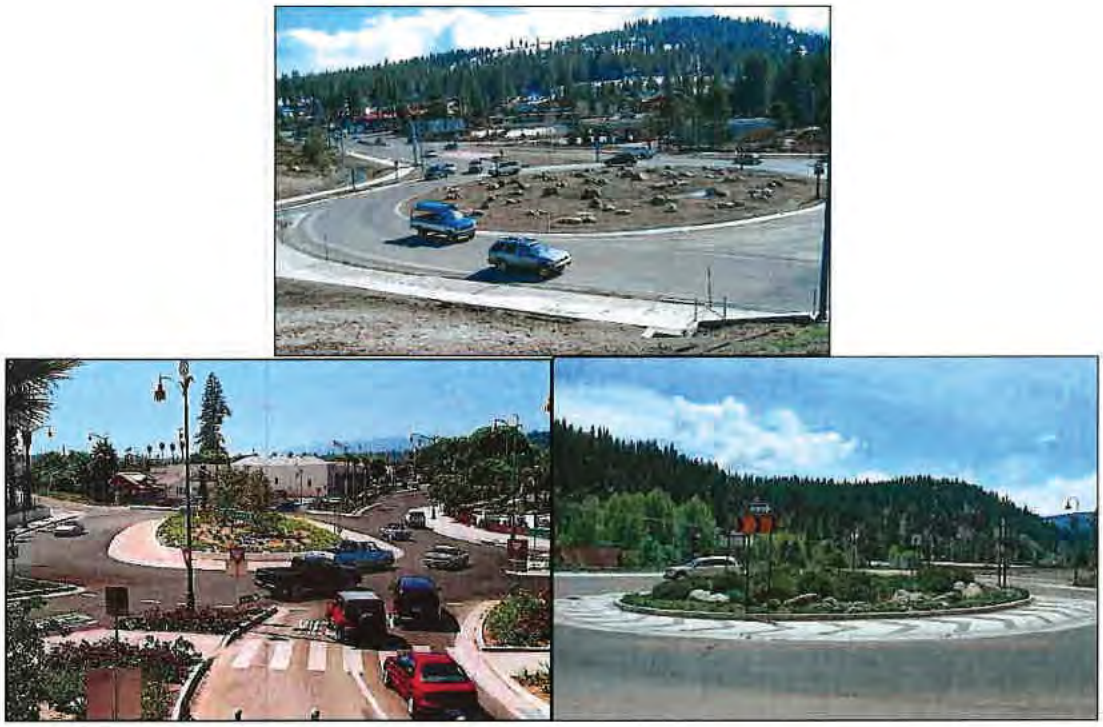
All special wall details such as sign bases, utility openings, drainage features, fences, and concrete barriers should be shown on the plan sheet of the wall concerned or included on a separate sheet with the wall plan sheets. Details should be cross-referenced on the wall sheets to the sheets on which they are shown.

EXHIBIT "B2"

ROUNDABOUT
GEOMETRIC DESIGN GUIDANCE

Federal Report # F/CA/RI-2006/13

FINAL REPORT



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GEOMETRIC DESIGN GUIDANCE

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16. Abstract

This research report is intended to examine the geometric standards, guidelines, and practices used nationally and by other states to develop recommendations on roundabout design guidance for California. This research serves as a guidance tool in support of Caltrans' policy and standards within the Highway Design Manual and other statewide documents. Recommendations made from this research will guide Caltrans and other agencies in California in designing and operating roundabouts.

Several major areas were examined through this project, including assessing the operational performance of California roundabouts and developing calibrated capacity models consistent with recent national research (NCHRP 3-65); developing a calibrated intersection sight distance model; examining pedestrian and bicycle behavior at existing California roundabouts and comparing their performance to national observations; and developing a range of recommendations on geometric design parameters, including vehicle speeds, design vehicle, inscribed circle diameter, and issues related to roundabouts with more than four legs, roundabouts at freeway interchange terminals, and roundabouts in high-speed environments. The research resulted in a number of recommendations regarding the fundamental principles behind these elements, illustrated by tables and figures.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

DISCLAIMER

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of California or the Federal Highway Administration. This report does not constitute a standard, specification or regulation.

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The report is the result of a collaborative effort among three organizations. The University of Nevada Reno served as principal investigator and led the operational analysis components of this project. California State University, Chico, led the pedestrian and bicycle components. Kittelson & Associates, Inc., led the design components and assembled and edited the final report.

The authors would also like to acknowledge Eric Waltman of Kittelson & Associates, Inc., who contributed to the early stages of the design components of this report. In addition, the authors acknowledge the contributions of the members of and advisors to the Roundabout Task Force of the National Committee on Uniform Traffic Control Devices, through which the figures for the upcoming Manual on Uniform Traffic Control Devices were developed.

EXECUTIVE SUMMARY

Roundabouts have emerged as an increasingly popular tool to improve safety and operational efficiency at intersections throughout the United States, including California. Several research efforts have been underway to enhance U.S. practitioners' limited knowledge of and experience with designing and operating modern roundabouts, including FHWA's *Roundabouts: An Informational Guide* (FHWA Guide), and a number of subsequent state supplements. Such supplemental guidelines sometimes deviate from the guidance published in the FHWA Guide, which has created some concern about the best practice to recommend in California. This research project examined literature and relevant field data from roundabouts in California and elsewhere to specifically address the issues related to roundabout design and operation in California.

Several major areas were examined through this project:

- *Operational performance of California roundabouts.* The research team collected and analyzed operational performance data at nine existing California roundabouts to determine the gap acceptance behavior of California drivers. The resulting measurements, critical headway and follow-up headway, can be used to calibrate the capacity models developed by the recent national research project, NCHRP 3-65, as published in NCHRP Report 572, *Roundabouts in the United States*, and to calibrate the intersection sight distance model given in the FHWA Roundabout Guide.

- *Pedestrian and bicycle behavior.* The behavior of pedestrians and bicyclists at roundabouts was examined in a number of ways. First, pedestrian and bicyclist demand data was collected at intersections that are anticipated for conversion to roundabouts to facilitate a future study on the effects roundabouts have on pedestrian and bicyclist use. Second, the behaviors of pedestrians and bicyclists were examined at existing roundabouts in California using a methodology similar to that used on a national scale for NCHRP 3-65. Third, crash reports involving pedestrians and bicyclists at roundabouts were examined to identify any patterns that may be corrected through design.

- *Geometric design.* A variety of geometric design elements of interest to Caltrans were examined through this research, including vehicle speeds, design vehicle, inscribed circle diameter, and issues related to roundabouts with more than four legs, roundabouts at freeway interchange terminals, and roundabouts in high-speed environments. The research resulted in a number of recommendations regarding the fundamental principles behind these elements. These are illustrated by tables and figures.

Key specific findings from the research include the following:

- Attention to the overall layout of a roundabout is often more critical than the dimensions of individual components. In effect, roundabout design is performance-based; that is, success is measured from its output (operational and safety

performance, accommodation of design vehicle, pedestrian and bicycle usability, etc.) rather than its input (individual design dimensions).

- The following California-specific values for critical headway and follow-up headway should be used to calibrate capacity models to determine appropriate lane numbers and arrangements:
  - Single-lane roundabouts: critical headway = 4.8 s, follow-up headway = 2.5 s.
  - Multilane roundabouts, left lane: critical headway = 4.7 s, follow-up headway = 2.2 s.
  - Multilane roundabouts, right lane: critical headway = 4.4 s, follow-up headway = 2.2 s.
- Using the above calibrated values, the following capacity models can be used in a manner consistent with the recommendations from NCHRP 572, with c equal to capacity (passenger car equivalents per hour) and v_c equal to the conflicting flow rate (passenger car equivalents per hour):
  - Single-lane: $c = 1440 \cdot \exp(-0.0010 \cdot v_c)$
  - Multilane right lane: $c = 1640 \cdot \exp(-0.0009 \cdot v_c)$
  - Multilane left lane: $c = 1640 \cdot \exp(-0.0010 \cdot v_c)$
- The current methodology presented in the FHWA Guide for estimating vehicular speeds throughout the roundabout should be modified to account for acceleration and deceleration effects.
- While speed prediction for the various movements through a roundabout is reasonably accurate, the data show a trend between increased speeds and increased crash experience. However, this trend is not necessarily one that is statistically conclusive. Many sites in the NCHRP 3-65 database experienced few to zero crashes, and the site-to-site variation for the sites with nonzero crash experience is often significant.
- The NCHRP 3-65 data generally support the use of a 25 mph threshold for an entry speed adjusted for the effects of deceleration. However, the resulting crash experience can vary significantly among sites.
- Speed differentials of more than 10 mph between adjusted entry speeds (accounting for deceleration) and left-turn circulating speeds appear to correspond to an increase in entry-circulating crashes. Therefore, the FHWA Guide's recommendation for a maximum speed differential of 12 mph appears to be supported if one adjusts entry speeds for deceleration effects.

- The report has suggested the appropriate design vehicles and side-by-side accommodation through single-lane and multilane roundabouts for various types of roadways.

- Care must be taken with the design of roundabouts to minimize exit-circulating conflicts through the appropriate spacing of entries and following exits. Examples have been provided.

- Care must be taken with the design of roundabouts to ensure appropriate visibility angles to the left. This need occurs most commonly in roundabouts with consecutive entries, such as at freeway interchange terminals. Examples have been provided.

- Typical ranges of inscribed circle diameter have been provided; however, inscribed circle diameter is a product of other factors and not a critical input parameter by itself.

- For intersection sight distance calculations, a California-specific critical headway of 5.9 seconds is recommended instead of the 6.5 seconds presented in the FHWA Guide. This methodology should be considered interim until a study on roundabout intersection sight distance is completed.

- The effect of roundabouts on pedestrian and bicyclist demand remains an open question. Data collected from sites anticipated to be converted to roundabouts will support a future research effort to address this question.

- Current U.S. design methods to accommodate pedestrians appear to be appropriate, although further research is needed to develop appropriate treatments to accommodate pedestrians with vision disabilities. The uncontrolled crosswalk treatments appear to operate well for the majority of users (pedestrians and conflicting vehicles). The use of a setback of one to two vehicles from the roundabout appears to be effective. Stopping sight distance needs to be provided so that motorists have the proper time to react after observing a pedestrian using the roundabout crosswalk; the same sight distance requirement helps pedestrian determine the appropriate time to enter the crosswalk. The pedestrian crossing treatments and methodology for selecting treatments as suggested in TCRP Report 112/NCHRP Report 562 should be considered.

- For pedestrians with visual impairments, recent and ongoing research suggests that a simple, uncontrolled crosswalk may be insufficient to provide access at some roundabouts, particularly at multilane roundabouts. The Access Board has made the draft recommendation that all pedestrian crossings that span two or more entry or exit lanes be provided with some form of signalization. Research on this treatment and other less restrictive treatments is being conducted as part of NCHRP 3-78 and other studies. The authors recommend caution in establishing a California-wide policy until that research is complete.

- Current U.S. design methods to accommodate bicyclists of a range of abilities—allowing cyclists to circulate as vehicles or as pedestrians—appear to be appropriate.

This includes the provision of a wider sidewalk or shared path around the perimeter of the roundabout and ramps to connect the sidewalk or path to the bicycle facilities on each leg as appropriate. The current U.S. recommendations to not stripe bike lanes within a roundabout help to address the exit-circulating conflict found in European experience. At multilane roundabouts, the evidence from this study suggests that it may be appropriate to use yield signs on a shared path around the roundabout, as many cyclists are riding rather than walking their bicycles.

1. INTRODUCTION

1.1. Background

Roundabouts have been used worldwide as an efficient intersection control type to improve safety and operational efficiency. However, application of modern roundabouts in the U.S. is more recent, with the first modern roundabout constructed in 1990 and the majority opened within the past few years. As evidence emerges for its effectiveness in reducing the number and severity of accidents, it is anticipated that more and more roundabouts will be built on U.S. streets and highways, including those in the State of California.

Several research efforts have been underway to enhance U.S. practitioners' limited knowledge of and experience with designing and operating modern roundabouts. In 2000, the FHWA developed a guide titled, *Roundabouts: An Informational Guide* (*1*), to pull together both national and international guidance into a single document. Since that time, some states, such as Kansas (*2*), have developed supplemental guidelines to further address their design needs specific to their state or to reflect more current thinking within the profession. Such supplemental guidelines sometimes deviate from the guidance published in the FHWA guide, which resulted in inconsistencies among state practices while designing and operating a roundabout. An effort is underway (initiated in February 2007, with completion expected in 2009) to update and produce a Second Edition of the FHWA guide as part of NCHRP Project 3-65A.

Compared to some other states in the U.S., California has implemented a limited number of roundabouts, with the majority being urban single-lane roundabouts located off the State highway system. Because of evidence supporting the significant safety benefits of roundabouts, it is anticipated that a growing number of roundabouts will be built on California's highways over the coming years. As a result, Caltrans has developed preliminary guidance for roundabouts in Design Information Bulletin (DIB) Number 80-01 (*3*) and is in the process of updating its Highway Design Manual (HDM) (*4*) to reflect state-of-the-art practices. This research project is designed to specifically address the issues related to roundabout design and operation for Caltrans. It is critical to examine different state practices before developing guidelines to suit California's local traffic and environment conditions.

1.2. Scope and Objectives

This research project's major outcome is a comprehensive document that addresses the key roundabout design elements based on current practices and research. This document is anticipated to serve as a primary resource for updating the HDM and DIB 80. These documents will help ensure that future roundabouts in California follow best practices and achieve maximum benefits.

This report has the following major components:

- An assessment of vehicle operational performance by drivers at California roundabouts.

- An assessment of pedestrian and bicycle behavior at California roundabouts and other roundabouts around the United States.
- An assessment of key geometric design parameters of interest to Caltrans.
- Conclusions and recommendations.

2. VEHICLE OPERATIONS ASSESSMENT

Roundabouts have been used worldwide as an efficient intersection control type to improve safety and operational efficiency. Two major operational parameters are often used to perform the operational analysis and geometric design of roundabouts: critical headway and follow-up headway. These are generally defined in the *Highway Capacity Manual* (HCM) as follows (*5*):

- *Critical headway.* This is the minimum time between successive major-stream vehicles in which a minor-street vehicle can make a maneuver. Critical headway has been historically referred to as critical gap (including the HCM 2000).

- *Follow-up headway.* The time between the departure of one vehicle from the minor street and the departure of the next vehicle using the same gap under a condition of continuous queuing.

These two parameters reflect driver's behavior at roundabouts and are the main factors used to estimate capacity at roundabouts through analytical techniques. Critical headway is also one of the major parameters used to calculate intersection sight distance in roundabout design. Adequate intersection sight distance assists in providing safe operations, but excessive intersection sight distance at roundabouts may result in high vehicle entry speeds that could lead to higher crash frequencies (*1*, *6*).

This chapter discusses how to measure these two operational parameters for use in the operational analysis and design of roundabouts in California. The chapter first discusses the current values for critical headway and follow-up headway at roundabouts (found in the literature), then discusses the measurement and analysis of those parameters on roundabouts in California.

2.1. Literature Review

This section presents an overview of the use of operational parameters in capacity estimation and design, followed by a discussion of the current use of those parameters for roundabout analysis and design. Finally, the section discusses recent national research on these parameters.

2.1.1. Background

Generally, there are two basic methods to evaluate the capacity for each roundabout category: analytical and regression. Recent national research in the U.S. has determined that a simple empirical regression model best fits the latest U.S. operational performance data (*7*). The research also found that an equivalent gap-acceptance model using critical headway and follow-up headway can be used to develop capacity estimates that can be calibrated to local conditions.

The other major use of critical headway is in design, specifically to calculate intersection sight distance. In general, the critical headway at roundabouts represents the minimum time interval in the circulating flow during which a vehicle can safely enter a roundabout. Specifically, according to FHWA Guide (*1*), critical headway for sight distance purposes is the amount of time required

for a vehicle to enter a roundabout while requiring the conflicting stream vehicles to slow their initial speed by no more than 70 percent. A driver rejects any headway that is less than his/her personal critical headway and accepts any headway that is equal to or greater than the critical headway. Longer headways in the circulating/conflicting traffic stream provide the entering vehicles with an opportunity for multiple entries. The number of such entries is determined by the follow-up headway. The follow-up headway is the minimum time interval between two successive vehicles in a queue entering the roundabout using the same gap (headway) in the conflicting/circulating traffic stream.

2.1.2. Critical Headway and Follow-Up Headway Values in Use

The FHWA Guide identifies the critical gap value as 6.5 seconds based on the critical gap required for passenger cars, which are assumed to be the most critical design vehicle for intersection sight distance. This assumption holds true for single-unit and combination truck speeds that are at least 10 km/h (6 mph) and 15 to 20 km/h (9 to 12 mph) slower than passenger cars, respectively.

Most of the state DOTs who have developed guidelines for roundabout design and operations adopt the critical headway recommended by the FHWA Guide. However, some variations exist. The current Caltrans Design Information Bulletin (DIB) 80-01 (*3*) states that designers shall use the critical headway value of 6.5 seconds recommended by the FHWA Guide as an initial design parameter for the purpose of determining intersection sight distance. If the design speed or speed consistency cannot be obtained, DIB 80-01 states that the geometries should be modified to meet the target design speed through the circulatory roadway. If the target speed cannot be met in this fashion, the value for the critical headway may be reduced until the target design speed is achieved, or until the minimum critical headway value of 5.0 second is reached.

In their supplement to the FHWA Guide, the Kansas Department of Transportation adopts the FHWA Guide's 6.5-second critical headway, but notes that the critical headway may be reduced to 4.6 seconds in locations where sight distance may be constrained by adjacent topography features or buildings (*2*). This value is based on the more conservative critical headway given for single-lane roundabouts in the *Highway Capacity Manual 2000* (*5*). The state of Arizona has adopted similar discussions (*8*).

The Wisconsin Department of Transportation's roundabout guidance in their *Facilities Design Manual* (*9*) recommends a critical headway of 4.5 seconds. The source for this lower value is undocumented.

Based on a recent study (*10*), the Utah Department of Transportation adopted the critical headway values from SIDRA (a computer software program for roundabouts developed in Australia), where the minimum critical headway is 2.0 seconds and the maximum critical headway is 8.0 seconds, and the two boundary critical headway values from the HCM (4.1 seconds and 4.6 seconds) (*5*). These critical headway values are mainly used for the purpose of conducting operational analyses.

In summary, most state DOTs who have developed roundabout guidelines have adopted the critical headway recommended by the FHWA Guide, except Wisconsin and Utah where

significant deviations are noticed. Some states such as California and Kansas recognize that critical headway should be adjusted to meet the ultimate design objectives, such as the target design speed. The recently completed NCHRP 3-65 report includes a new set of critical headway and follow-up headway values based on data from more than 500 hours of video at various roundabout locations throughout the U.S. However, the data did not include any sites in California. As a result, it is unclear whether the critical headway and follow-up headway from NCHRP 3-65 may or may not be representative of California's conditions. As one of the major research tasks, data need to be collected at roundabout sites in California and the critical headway and follow-up headway need to be measured at these sites to better reflect California's conditions.

2.1.3. Recent National Research

Critical headway is affected by local conditions such as geometric layout, driver behavior, vehicle characteristics, and traffic conditions (*11*). The recently completed NCHRP Report 572 (*7*), which documents the results of NCHRP 3-65, highly recommends that practitioners calibrate the critical headway and follow-up headway based on local conditions in order to provide accurate capacity estimates. This report provides the critical headway results measured at 14 sites using the Maximum Likelihood Technique (*12*). The study reveals that the critical headway at single-lane roundabouts varies between 4.2 and 5.9 seconds, and the critical headway at multilane roundabouts varies between 3.4 and 4.9 seconds in the right-lane, and 4.2 and 5.5 seconds in the left-lane. For purposes of calculating intersection sight distance, NCHRP Report 572 identifies a critical headway value of 6.2 seconds for determining intersection sight distance, derived from the mean critical headway (5.1 seconds) plus one standard deviation (1.1 seconds).

NCHRP Report 572 also includes a new set of follow-up headway values based on data collected from six states: Washington, Maryland, Maine, Michigan, Oregon, and Vermont. The report recommends follow-up headways of 3.2 seconds at single-lane roundabouts, 3.4 seconds for the left lane at multilane roundabouts, and 3.1 seconds for the right lane at multilane roundabouts.

2.2. Data Collection and Analysis

This section presents the details of data collection, data extraction, and critical and follow-up headway measurement results and analyses. First, field data collection efforts (e.g., video taping) are described, followed by discussions on the data extraction process from the videos. Based on the time events extracted from the videos, measurements of the critical headway and the follow-up headway are conducted. The results are then compared with those from other studies. The results of an analysis of the factors affecting critical headway and follow-up headway are also provided.

2.2.1. Field Data Collection

Roundabout operations were videotaped in the field, along with geometry, vehicle speed, and any abnormal site conditions. The data from the recorded videos were extracted in the lab, and the other field-recorded data was used to analyze the factors that may affect critical headway and follow-up headway.

In June 2006, field data was collected at ten roundabout sites located in six California cities: Truckee, Modesto, Calabasas, Santa Barbara, Long Beach and Davis. Typically, the videos were recorded during the weekday peak periods when high traffic volumes could be observed. To increase the sample size, two additional hours of video were taken at the sites in Truckee and Davis. Only the approach with the highest traffic volume was video-taped, using a single camera mounted on a tripod. Table 1 contains a summary of the ten roundabout sites.

Of the ten sites, seven were single-lane roundabouts and three were multilane. Because the Bowen Avenue/Fremont Avenue roundabout in Modesto had very low traffic volumes and the number of data samples would not be sufficient for critical headway and follow-up headway measurements, an additional two hours of data was collected at the James Street/G Street roundabout, also in Modesto, during the midday peak hours.

In the field, circulating vehicle speeds were recorded using a radar gun. The vehicle speeds were recorded to analyze whether vehicle speed affects driver's critical headway and follow-up headway. Figure 1 shows the zone where the speeds were measured. In this case, the study approach is the eastbound approach, i.e., the eastbound approach was video taped and studied for critical headway and follow-up headway.

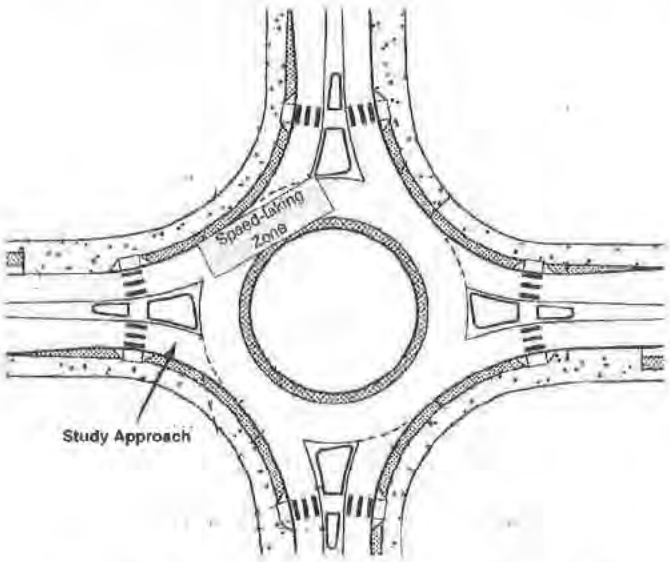


Figure 1. Circulating Speed Measurement Zone

Field observations revealed that most single-lane roundabouts were located in residential areas and were mainly used as traffic calming devices. Therefore, these traffic volumes were generally low. Much higher traffic volumes were observed at the three multilane roundabouts.

Pedestrian and bicycle use at roundabouts was also low. Moderate pedestrian and bicycle volumes were observed only at two sites: James Street/G Street in Modesto, and Anderson Road/Alvarado Avenue in Davis. The pedestrian and bicycle activity at these two sites is further documented in Chapter 3 of this report.

Table 1. Ten Roundabout Sites Observed in California

City	Site ID	Site Name	Date and Time Period of Data Collection (all dates 2006)	Duration of Extracted Video	Number of Circulating Lanes
Calabasas	CA01	#14: Parkway Calabasas/Camino Portal	Thursday, June 15, 7:00 a.m. to 9:00 a.m.	2 hours	1
Davis	DA01	#6: Anderson Rd./Alvarado Ave	Sunday, June 18, 11:30 a.m. to 1:30 p.m.	2 hours	1
			Tuesday, June 20, 4:00 p.m. to 6:00 p.m.	2 hours	1
Long Beach	LB01	#10: Los Alamitos Circle	Friday, June 16, 4:00 p.m. to 6:00 p.m.	2 hours	3
Modesto	MO01	#11: Bowen Ave./Fremont Ave.	—	No Traffic	1
	MO02	#12: Bowen Ave./Phelps Ave.	Monday, June 12, 4:00 p.m. to 6:00 p.m.	2 hours	1
	MO03	#15: La Loma/James St./G St.	Tuesday, June 13, 7:00 a.m. to 9:00 a.m.	2 hours	1
			Tuesday, June 13, 11:30 a.m. to 1:30 p.m.	2 hours	1
Santa Barbara	SB01	#20: Milpas St./US 101 NB Ramps	Thursday, June 15, 4:00 p.m. to 6:00 p.m.	2 hours	2
	SB02	#19: Alameda Padre Serra/Salinas	Friday, June 16, 7:00 a.m. to 9:00 a.m.	2 hours	1
Truckee	TR01-W	#21: Donner Pass Rd.	Saturday, May 20, 11:30 a.m. to 1:30 p.m.	2 hours	1
			Tuesday, May 30, 11:30 a.m. to 1:30 p.m.	2 hours	1
	TR02-S	#22: I-80 EB Ramps/Hwy 89	Saturday, May 20, 4:00 p.m. to 6:00 p.m.	2 hours	2
			Tuesday, May 30, 4:00 p.m. to 6:00 p.m.	2 hours	2
Total				26 hours	

Two field observations that may reflect inadequate roundabout designs are worth mentioning. The first is inadequate entry deflection observed at the Bowen Avenue/Phelps Avenue roundabout in Modesto, a three-leg, single-lane roundabout. As shown in Figure 2, in the westbound direction there was a lack of entry deflection to reduce vehicle speed. This appears to have contributed to some collisions between vehicles and the curb, causing some damage to the curb.

Figure 2. Inadequate Entry Deflection and Curb Damage at the Bowen Avenue/Phelps Avenue Roundabout in Modesto

The second is vehicles running over the apron when traveling at higher speeds at the Anderson Road/Alvarado Avenue roundabout in Davis. According to the FHWA Guide, the truck apron is a mountable portion of the central island adjacent to the circulatory roadway. The purpose of a truck apron is to accommodate the wheel path of large vehicles at smaller roundabouts; passenger vehicles are discouraged from using it. The FHWA Guide recommends that the outer edge of an apron should be raised a minimum of 30 mm (1.2 inch) above the circulatory roadway surface. However, this roundabout in Davis does not have a raised apron; therefore, a number of vehicles were observed running over the apron and traveling through the roundabout at higher speeds. As shown in Figure 3, the apron is in disrepair, which may make it difficult for the drivers to see at night.

Figure 3. Inadequate Apron Design and Use at
Anderson Road/Alvarado Avenue Roundabout in Davis

2.2.2. Data Extraction

Necessary time events were tracked from the data to derive the various headway events needed to calculate the critical and follow-up headways. Three time events involving an entering vehicle were recorded: the time when an entering vehicle stopped at the entrance line, the passage times of circulatory vehicles that directly conflicted with the entering vehicle, and the time at which the stopped vehicle passed the entrance line. The passage times of circulating vehicles defined the start and end of major stream headways that were either accepted or rejected by the entering vehicles.

The procedure of extracting video data and measuring critical headway and follow-up headway included the following steps:

- *Step 1.* The time events (defined above) were recorded using *TDIP (Traffic Data Input Program)* computer software. TDIP was developed at the University of Idaho and has been used in research projects (NCHRP 3-46, NCHRP 3-65) to extract data events from videos.

- *Step 2.* The accepted headways, the maximum rejected headways, and the follow-up headways were extracted using a Microsoft Excel macro program developed by the research team. The accepted headways and the maximum rejected headways were used to estimate the critical headway using the Maximum Likelihood Methodology (*12*). In this study, the passage times of circulating vehicles were recorded when the front bumpers passed the conflicting point. The recorded passage times were used to

calculate the headways between successive circulating vehicles. The follow-up headways were directly obtained from the time events using the macro program. The raw time event data was validated, and any unrealistic time events were removed. For example, some unusual driver behavior was observed such as a stalled vehicle, which resulted in very large rejected headways. Such data was removed to minimize the errors from the headway measurements. In this study, a headway of 8 seconds was considered as the upper threshold for driver's acceptable headways. Therefore, any accepted headways greater than 8 seconds were reduced to 8 seconds.

- *Step 3.* Based on the results of Step 2, the Maximum Likelihood Methodology was used to derive driver's critical headway. Two headway-acceptance cases were identified. Case 1 was when a driver rejected at least one headway before entering the roundabout (the driver waited for at least one conflicting vehicle to pass), and Case 2 was when a driver accepted the first headway (referred to as a lag) without rejecting any headway (the driver entered before a conflicting vehicle passed). Table 2 and Table 3 illustrate the number of headways observed in the two headway-acceptance cases at single-lane and multilane sites, respectively. These headway data only included vehicles that stopped at the roundabout entry. As can be seen, the majority of vehicles were classified as Case 1.

Table 2. Accepted/Rejected Headway Cases at Single-Lane Sites

Site	Total No. of Headways	Case 1*	% of Total	Case 2**	% of Total
CA01-S	237	177	75%	60	25%
DA01-E	98	77	79%	21	21%
MO02-S	40	34	85%	6	15%
MO03-S	117	91	78%	26	22%
MO03-S	217	137	63%	80	37%
SB02-NW	321	237	74%	84	26%
TR01-W	136	113	83%	23	17%
Total	1166	866	77%	300	23%

* Case 1: Driver rejected one or more headways
** Case 2: Driver accepted the first available headway

Table 3. Accepted/Rejected Headway Cases at Multilane Sites

Site	Lane	Total No. of Headways	Case 1*	% of Total	Case 2**	% of Total
LB01-W	left	374	241	64%	133	36%
LB01-W	right	263	184	70%	79	30%
SB01-S	left	456	324	71%	132	29%
SB01-S	right	539	408	76%	131	24%
TR02-S	left	160	126	79%	34	21%
TR02-S	right	214	153	71%	61	29%
Total		2006	1436	72%	570	28%

* Case 1: Driver rejected one or more headways
** Case 2: Driver accepted the first available headway

2.3. Critical Headway Measurements

As discussed previously, the Maximum Likelihood Methodology was used to estimate the critical headway. It should be noted that critical headway cannot be obtained directly from the recorded time events. However, the Maximum Likelihood Methodology estimates the average critical headway of all the drivers based on the fact that a driver's critical headway is between two observeable values: the driver's largest rejected headway, and the driver's accepted headway.

2.3.1. Single-Lane Roundabouts

Table 4 provides a summary of the results of the critical headways measured at the single-lane sites. It can be seen that the critical headway varied between 4.5 and 5.3 seconds, with a mean

value of 4.8 seconds. These critical headway values are in a range similar to those reported by NCHRP 3-65; a detailed comparison is provided later in this paper.

Table 4. Critical Headway Results at Single-Lane Roundabout Sites

Site	Critical Headway	
	Mean (seconds)	Standard Deviation (seconds)
CA01-S	4.7	1.1
DA01-E	4.7	1.0
MO02-S	5.3	1.0
MO03-S, A.M.	4.8	1.3
MO03-S, Midday	5.0	1.1
TR01-W	5.0	1.1
SB02-NW	4.5	0.9
Average	4.8	1.1

2.3.2. Multilane Roundabouts

Headway events are defined differently for multilane roundabouts. For a two-lane entry, the vehicles in the right entry lane are assumed to only yield to the conflicting vehicles in the right-most circulatory lane, but the vehicles in the left entry lane are assumed to yield to the vehicles in all the circulatory lanes (*13*). Therefore, the headway events are extracted only based on pertinent conflicting vehicles.

Table 5 provides a summary of the critical headway results for the three multilane sites. As can be seen, the critical headway for the left lane varied between 4.4 and 5.1 seconds with a mean value of 4.7 seconds, and the critical headway for the right lane varied between 4.0 and 4.8 seconds with a mean value of 4.4 seconds. The critical headway was slightly higher in the left lane than that in the right lane, which is consistent with NCHRP 3-65.

Table 5. Critical Headways at Multilane Roundabouts

Site		Critical Headway	
		Mean (seconds)	Standard Deviation (seconds)
LB01-W	Left lane	4.4	0.9
	Right lane	4.0	1.1
SB01-NW	Left lane	4.8	1.1
	Right lane	4.5	1.0
TR02-S	Left lane	5.1	1.1
	Right lane	4.8	0.9
Average	Left lane	4.7	1.0
	Right lane	4.4	1.0

2.4. Follow-up Headway Measurements

Unlike critical headway estimation, follow-up headways were obtained directly from the recorded time events. By definition, follow-up headway is the minimum headway between two entering vehicles accepting the same gap, which is calculated by the difference between the passage times of two entering vehicles that accept the same mainstream headway under a queued condition. Once the individual follow-up headway is obtained, the average and the standard deviation can be calculated.

2.4.1. Single-Lane Roundabouts

Table 6 presents follow-up headways recorded at the single-lane roundabout sites, where the mean value, the standard deviation, and the sample size are listed for each site. It can be seen, the follow-up headway ranged between 2.3 and 2.8 seconds. The average for all the sites was 2.5 seconds. The largest follow-up headway, 2.8 seconds, was observed at Site DA01 in Davis, which is a compact roundabout in a residential area. The smallest follow-up headway, 2.3 seconds, was observed at Site MO03 in Modesto, which is located in the downtown area.

The average follow-up headway from this study was smaller than that of NCHRP 3-65.

Table 6. Follow-up Headway Results at Single-Lane Roundabouts

Site	Mean of Follow-up Headways seconds)	Standard Deviation of Follow-up Headways (seconds)	Sample Size
CA01-S	2.4	0.6	55
DA01-E	2.8	0.7	15
MO02-S	2.4	0.3	5
MO03-S,AM	2.3	0.7	14
MO03-S,Midday	2.6	1.0	58
SB02-NW	2.3	0.7	63
TR01-W	2.5	0.8	20
Average	2.5	0.7	Total = 230

2.4.2. Multilane Roundabouts

Table 7 shows the average follow-up headway at the three multilane roundabouts. The follow-up headways in the left-lane varied between 1.8 and 2.7 seconds, and the follow-up headways in the right-lane ranged between 2.1 and 2.3 seconds. The mean follow-up headways for both lanes were the same, both of which were 2.2 seconds. These values are smaller than that reported in NCHRP 3-65.

It should be noted that the results are based on a limited number of sites (three sites); however, the follow-up headway values from the three sites are rather consistent.

Table 7. Follow-up Headway at Multilane Roundabouts

Site		Average Follow-up Headway (seconds)	SD of Follow-up Headway (seconds)	Sample Size
LB01-W, left lane		2.2	0.6	125
LB01-W, right lane		2.1	0.7	75
TR02-S, left lane		1.8	0.7	27
TR03-S, right lane		2.1	0.9	59
SB01-NW, left lane		2.7	0.9	109
SB01-NW, right lane		2.3	1.0	117
Average	left lane	2.2	0.7	Total = 261
	right lane	2.2	0.8	Total = 251

2.5. Comparison with Other Studies

Comparisons were made between the results of this study (the California data) and the data from other sources including NCHRP 3-65, which reported data from sites in the U.S., Germany, and France, and data from the HCM. Table 8 summarizes the critical headway and follow-up headway values from these different sources.

Table 8. Critical Headway and Follow-up Headway from Different Sources

Model		Critical Headway (seconds)		Follow-up Headway (seconds)	
		One lane	Two lane	One lane	Two lane
HCM		4.1 to 4.6	N/A	2.6 to 3.1	N/A
Germany[1]		4.4	4.4	3.2	3.2
France[1]		N/A	N/A	2.1	2.1
NCHRP 3-65	Left lane	4.2 to 5.9 (5.1)[2]	4.2 - 5.5 (4.5)	2.6 - 4.3 (3.2)	3.1 - 4.7 (3.4)
	Right lane		3.4 - 4.9 (4.2)		2.7 - 4.4 (3.1)
California	Left lane	4.5 - 5.3 (4.8)	4.4 - 5.1 (4.7)	2.3 - 2.8 (2.5)	1.8 - 2.7 (2.2)
	Right lane		4.0 - 4.8 (4.4)		2.1 -2.3 (2.2)

Notes: 1. Results obtained from NCHRP Report 572 (7)
2. Numbers in ( ) indicate the average value

Based on the results shown in Table 8, the following observations were made. The statistical analyses will follow below:

- The critical headway based on California's sites was similar to the U.S. sites discussed in the NCHRP 3-65 study.

- The critical headways and follow-up headways used in the HCM and in Germany had similar values, but were generally smaller than those obtained from this California data and elsewhere.

- The follow-up headways from this research were very similar to that used in France; however, they were generally smaller than those reported in the NCHRP 3-65 report.

Statistical analyses were conducted to determine whether California drivers have critical headways and follow-up headways that are statistically different from those reported for other states in the U.S. in the NCHRP 3-65 study. Figure 4 shows the comparison and statistics of critical headways at the single-lane sites. There were 16 data points from the NCHRP 3-65 study, representing the critical headways from 16 different sites (ten from Washington, three from Maryland, two from Maine, and one from Oregon). The 95% confidence intervals were also plotted. Using confidence intervals for different populations is one of the means of conducting hypothesis tests in statistics. If the confidence intervals overlap each other, it means there is no significant statistical difference between the mean values of the two populations. As shown in Figure 4, the 95% confidence interval of the California sites is (4.64, 5.05) and the 95% confidence interval of other states is (4.81, 5.29). Because the 95% confidence intervals of two parameters overlap, this indicates that the two parameters are not statistically different at the 5% significance level. However, the conclusions drawn from statistical analysis must be carefully interpreted in practical applications. In this case, the statistical analysis indicates that there is no significant statistical difference between the critical headways of California and other states. Practically speaking, the mean critical headway values of California and other states seem to be nearly identical.

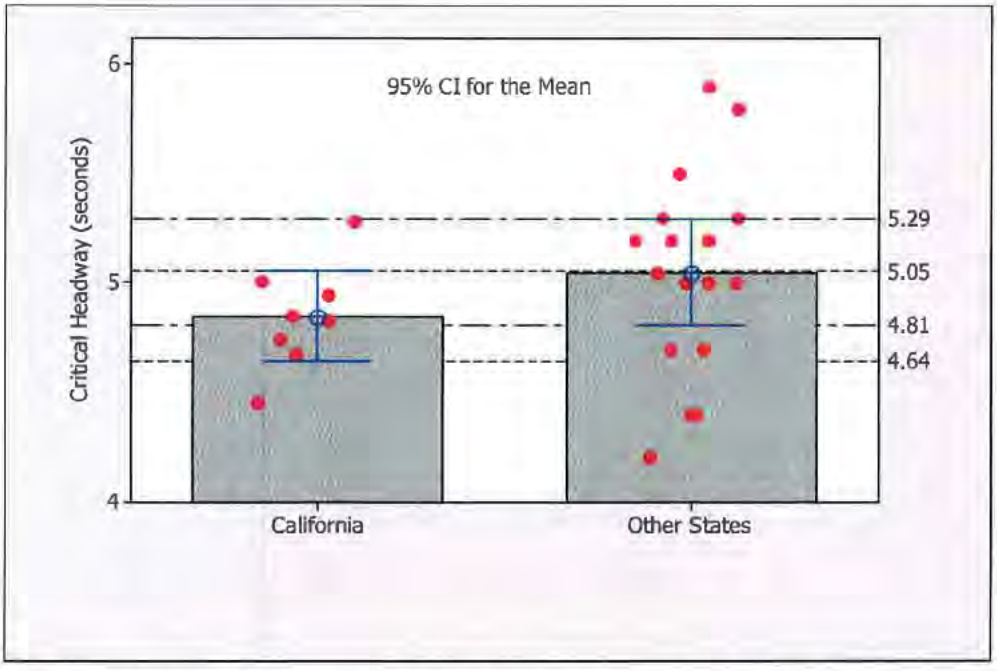


Figure 4. Comparison of Critical Headway, California and Other States: Single-Lane Sites

Figure 5 shows the comparisons of critical headways at the multilane sites, listed separately for the left turn and the right lane. There were seven data points from the NCHRP 3-65 report, representing the critical headways from seven different sites (three from Maryland, three from Vermont, and one from Washington). Although slightly different mean critical headway values were noticed, there was no significant statistical difference between the left lanes and the right lanes in California compared with other states, again indicated by the overlapping 95% confidence intervals. However, the number of multilane sites is very limited for both California and other states and does not support definitive conclusions. This is also shown by the wide range of the 95% confidence intervals, indicating that the estimate of the true mean is not precise. Further research on multilane roundabout sites is necessary.

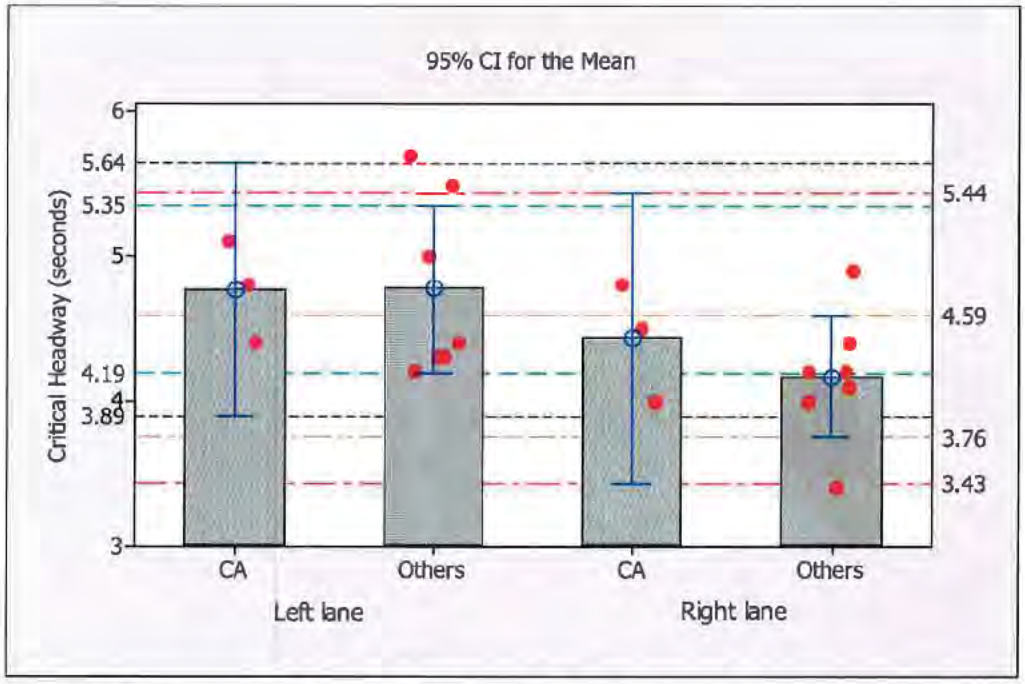


Figure 5. Comparison of Critical Headway, California and Other States: Multilane Sites

Figure 6 compares the follow-up headways at the single-lane sites. There were eighteen data points from the NCHRP 3-65 study, representing the average follow-up headways from eighteen different sites (eleven from Washington, three from Maryland, two from Maine, one from Michigan, and one from Oregon). As indicated by the 95% confidence intervals in the figure, California's follow-up headway was statistically significantly lower than that of other states. The mean follow-up headway in California was 2.4 seconds, whereas the mean follow-up headway in other states was 3.3 seconds.

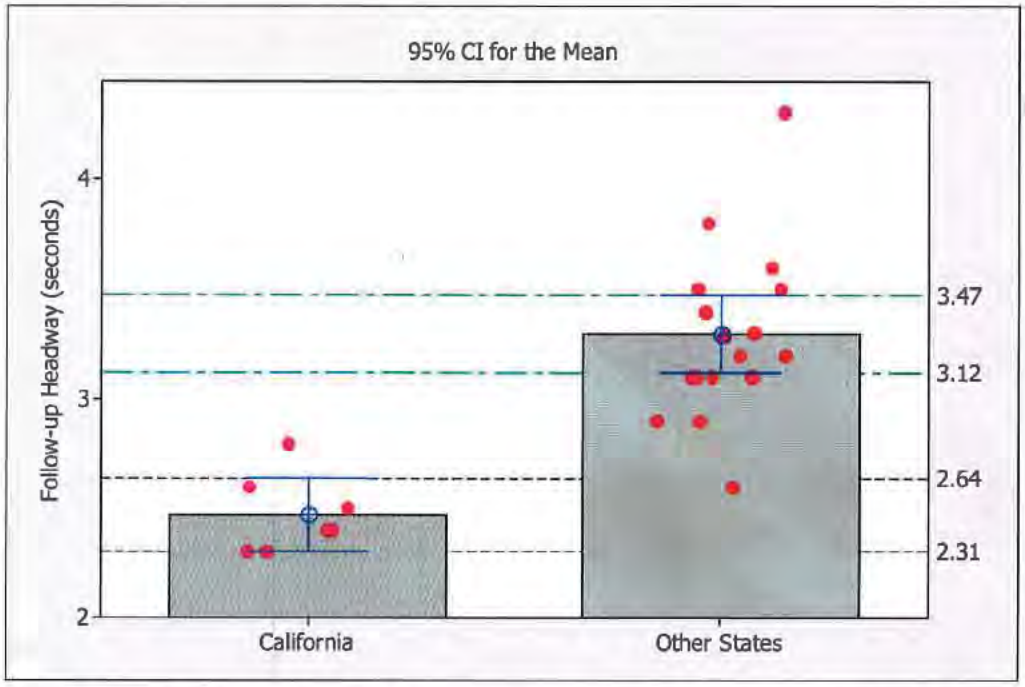


Figure 6. Comparison of Follow-up Headway between California and Other States: Single-lane Sites

Figure 7 compares the follow-up headways at the multilane sites, listed by the left lane and the right lane. There were seven data points from the NCHRP 3-65 study, representing the average follow-up headways from seven different sites (three from Maryland, three from Vermont, and one from Washington). As indicated by the 95% confidence intervals shown in the figure, California had a significantly lower follow-up headway than that of other states. Although the follow-up headway in the left lane did not show a statistically significant difference from other states, the smaller number of samples in California produced the high variance. From practical point of view, the difference is considered significant.

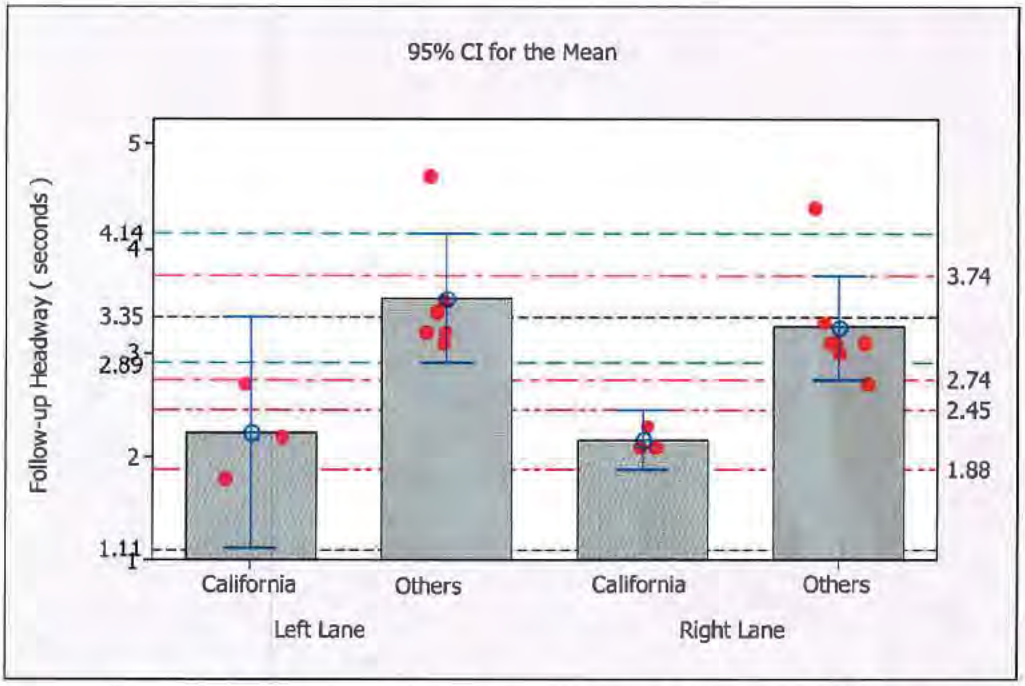


Figure 7. Comparison of Follow-up Headway between California and Other States: Multilane Sites

2.6. Analysis of Factors Affecting Critical Headway and Follow-up Headway

An investigation was conducted on the factors that may affect critical headway and follow-up headway. The factors investigated include the number of exiting vehicles in the circulatory traffic, the conflicting volume, and the speed of the circulating vehicles.

2.6.1. Impact of Exiting Vehicles on Critical Headway and Follow-up Headway

Similar to the major-street right-turn vehicles at two-way stop-controlled intersections, it was expected that exiting vehicles in the circulatory traffic at roundabouts might also influence the behavior of entering vehicles. Such an impact was clearly seen during field observations, especially at compact and small roundabouts. For example, at the MO03-S site in Modesto shown in Figure 8, the entering vehicles in the westbound La Loma Avenue always tended to stop when facing exiting vehicles. With a higher percentage of exiting vehicles, a larger critical headway was expected, especially with the tight geometric layout, high circulating speed, and limited intersection sight distance. However, this assumption is based only on the field observations. At this time, no data is available yet to support this assumption.

Figure 8. Impact of Exiting Vehicles at Modesto Roundabout MO03-S

2.6.2. Impact of Circulating Traffic on Critical Headway and Follow-up Headway

Previous studies indicate that the conflicting volume and vehicle speeds might affect the behavior of drivers in the minor traffic stream. For example, based on the data from Australia (*14*), the follow-up headway at single-lane roundabouts was related to both roundabout size (inscribed circle diameter) and circulating flow rate. Higher circulating flow rates resulted in much smaller follow-up headways. Where circulating flow rates are low, the follow-up headway varied between 2.27 to 2.99 seconds when the inscribed circle diameter was between 60 and 240 feet. The follow-up headway was as low as 1.7 seconds when the circulating flow approached 1,500 vehicles per hour (vph). At two-lane roundabouts with a circulating flow rate of 2,500 vph, the follow-up headway was as low as 1.3 seconds. NCHRP 3-65 reported moderate inverse correlation between critical headway and conflicting flow rate, suggesting that the critical headway tended to decrease with an increase in conflicting flow rate.

A simple correlation analysis was applied to the California data to investigate whether the conflicting flow and vehicle speeds have any impact on critical headway and follow-up headway. The correlation analysis provided two measures: linear correlation coefficient and P-value. The correlation coefficient is a measure of the linear relationship between two attributes or columns of data. The correlation value can range from –1 to +1 and is independent of the units of measurement. A value near 0 indicates poor correlation between attributes; a value near +1 or –1 indicates a high level of correlation. When two attributes have a positive correlation coefficient, an increase in the value of one attribute indicates a likely increase in the value of the second attribute. A negative coefficient indicates that one attribute tends to show an increase when the other one show a decrease. The P-value is used for hypothesis test of the correlation coefficient being zero. Table 9 presents the correlation analysis results.

Table 9. Results of Correlation Analysis

Parameter		Critical Headway	Follow-up Headway
Conflicting Flow	Pearson Correlation	–0.522	–0.037
	P-value	0.067	0.905
Circulating Speed	Pearson Correlation	–0.447	–0.684
	P-value	0.126	0.01

From Table 9, the critical headway and conflicting flow had moderate negative correlation (–0.522), with a P-value of 6.7%, which is slightly above the normally acceptable 5% significance level. This may be characterized as marginally significant statistically. The moderate negative correlation means that critical headway and conflicting flow had a weak inverse linear relationship, where the increase in conflicting flow might result in a decrease in the critical headway. This relationship is illustrated in Figure 9.

Table 9 also indicates that the correlation between follow-up headway and conflicting flow was weak (correlation coefficient of –0.037 and P-value of 0.905). This is indicated in Figure 9, where the follow-up headway was not sensitive to the conflicting flow.

The speed of the circulating traffic had a negative correlation (–0.447) with the critical headway, indicating the circulating speed did affect critical headway, but a linear correlation between the two parameters is weak (P-value of 0.126). As shown in Figure 10, an increase in speed may result in a decrease in critical headway.

The speed of the circulating vehicles had a negative correlation to follow-up headway (–0.684) and the linear correlation was strong (P-value of 0.01). As shown in Figure 10, the follow-up headway decreases as the conflicting speed increases.

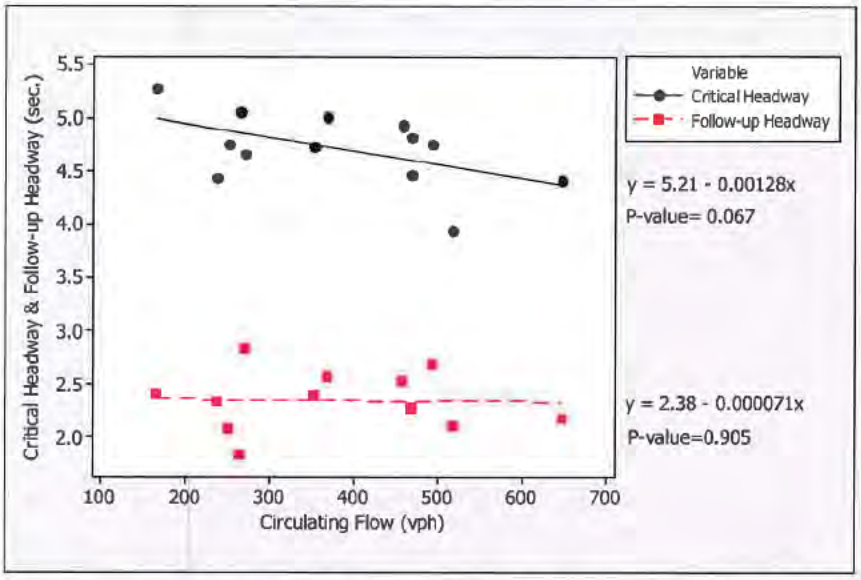


Figure 9. Critical Headway and Follow-up Headway as a Function of Circulating Flow

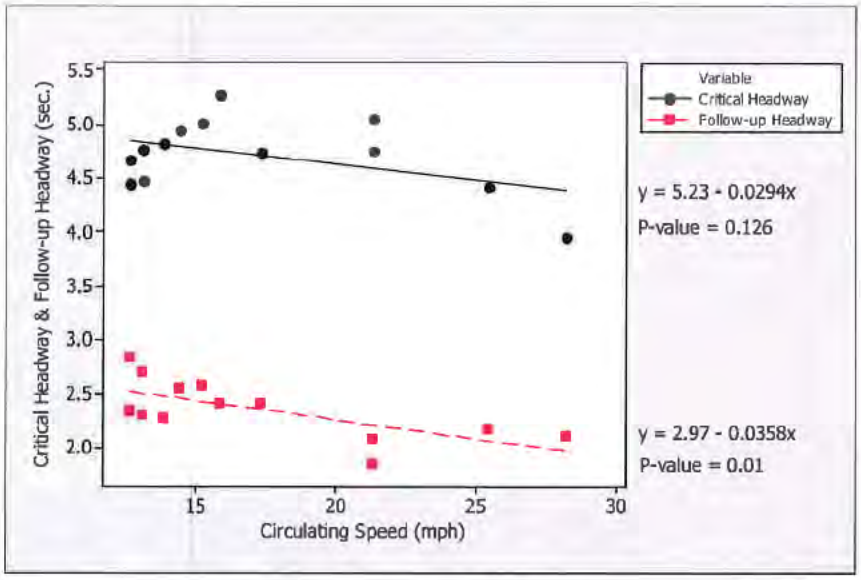


Figure 10. Critical Headway and Follow-up Headway as a Function of Circulating Speed

2.7. Summary and Conclusions

A summary of the major findings and conclusions from this research task is presented below. Please note that conclusions regarding multilane roundabouts may be considered preliminary due to the limited number of sites (three).

- Critical headway at the single-lane roundabouts (seven sites) in California was found to vary between 4.5 and 5.3 seconds, with a mean of 4.8 seconds. At multilane roundabouts (three sites), critical headway ranged between 4.4 and 5.1 seconds in the left-lane, and 4.0 and 4.8 seconds in the right-lane. The average critical headways for the two lanes were 4.7 and 4.4 seconds, respectively. These critical headway values were within the range reported in NCHRP Report 572. Statistical analyses did not show a significant difference between the critical headway values in California and other states in the U.S.

- A total of 742 individual follow-up headways were collected at the ten roundabout sites; 230 were from single-lane sites, and 512 were from multilane sites. The mean follow-up headway was 2.5 seconds at the single-lane sites. For multilane sites, the mean follow-up headway was 2.2 seconds for both the left and right lanes. These follow-up headways were statistically different from those obtained from other states as reported in NCHRP Report 572.

- The conflicting flow rate and speed were found to have moderate to low negative correlation with both critical headway and follow-up headway, which means that with an increase in conflicting flow and/or speed, the critical headway and follow-up headway tend to decrease. However, the results from the correlation analyses indicate that the correlation between speed and follow-up headway is the strongest, and the correlation between conflicting flow and follow-up headway is the weakest. Field observations also revealed that exiting vehicles were another factor with the potential to affect critical headway and follow-up headway; however, data was not available yet to support any quantitative conclusions.

3. PEDESTRIAN AND BICYCLE CONSIDERATIONS

Pedestrians and bicycles are important users of the transportation system. This chapter presents four major elements:

- Discussion of key literature related to pedestrian and bicycle use of roundabouts;
- Collection of pedestrian and bicycle usage at sites that are anticipated to be converted to roundabouts to allow for a future before-after study of roundabout use by pedestrians and bicycles;
- Review of pedestrian and bicycle use at California roundabouts; and
- Review of reported pedestrian and bicycle collisions at roundabouts across the United States.

Chapter 4 includes design recommendations based on this research.

3.1. Pedestrian Literature

This section provides a review of the literature related to pedestrian safety and accessibility at roundabouts in the United States and other countries.

3.1.1. Current Pedestrian Design Guidance

Most state guidelines in the U.S. include recommendations and policy considerations related to pedestrians at roundabouts. The FHWA Guide presents design guidelines related to pedestrian facilities at roundabouts, including pedestrian crossing locations and sidewalk treatments. The FHWA Guide suggests that the location of the pedestrian crossing needs to balance pedestrian convenience, pedestrian safety, and roundabout operation. Similar to the FHWA Guide, most state guidelines recommend that a crosswalk be 1 or 2 car lengths from a yield line. This reduces concurrent decision-making for drivers and minimizes the impact of vehicle queues on roundabout operation. Sidewalks are recommended to be set 5 feet (with a minimum set back of 2 feet) from the edge of the circulatory roadway.

3.1.2. National and International Pedestrian Research

European experiences have generally, if not universally, indicated that roundabouts are safer for pedestrians than other traditional types of intersections (*15*). Limited studies in the U.S. have shown a similar trend (*16*, *17*).

As part of NCHRP 3-65, Harkey and Carter (*18*, also *7*) conducted one of the most comprehensive studies to date of pedestrian safety at roundabouts in the U.S. They carefully tabulated 769 pedestrian crossing events at seven roundabouts. The majority of the roundabouts observed in the study showed few safety problems for crossing pedestrians, with very few recorded pedestrian crashes and few observed conflicts. However, the limited number of

pedestrian movements in the behavior videos was not sufficient to make statistical analyses or draw any definitive conclusions. Major findings from their study include:

- The percentage of drivers who do not yield to pedestrians is higher than stop controlled and signalized intersections, but lower than uncontrolled pedestrian crossings.

- Drivers yield to pedestrians less frequently on exit legs than on entry legs and on two-lane crossings than on one-lane crossings. For single-lane crossing sites, 29 percent of the motorists did not yield to the pedestrians on the exit leg; 10 percent did not yield on the entry leg. For two-lane crossing sites, 62 percent of the motorists did not yield to the pedestrians on the exit leg; 33 percent did not yield on the entry leg.

- Drivers yield to pedestrians less frequently on two-lane approaches than on one-lane approaches: 43% did not yield on two-lane approaches, whereas 17% did not yield on one-lane approaches.

- In the 769 pedestrians crossing events observed, four conflicts were identified in which interaction occurred where either the pedestrian or the motorist had to react to avoid a collision. All four conflicts occurred in one-lane roundabouts approaches. The overall conflict rate was established as 2.3 conflicts per 1,000 opportunities, with one-lane approaches having a higher rate than two-lane approaches.

- An emphasis needs to be placed on designing exit legs to improve upon the interaction between motorists and pedestrians. Harkey and Carter suggest that modifications could include design changes (e.g., reductions in exit radius and/or lane width), operational changes (e.g., static warning signs, real-time devices that warn when a pedestrian is present), and enforcement and education (e.g., improving user compliance with existing rules of the road).

- Multilane roundabouts may require additional traffic control measures to ensure safe access for pedestrians. Harkey and Carter do not elaborate further on these measures.

Harkey and Carter also compared the results of the observational analysis at roundabouts with observational analysis at conventional intersections. The behavior characteristics categorized for conventional intersections were different from categories used for the roundabouts. Still, they observed that behaviors of motorists and pedestrians were similar to behaviors observed at conventional intersection with no traffic control and those observed at crossings with signal or stopped control.

Harkey and Carter state that the "overwhelming majority of the roundabouts in this observational study showed very few problems for pedestrians and bicyclists." In terms of pedestrian safety, the roundabouts under study had only four observed conflicts and no reported collisions. The paper concludes that an emphasis needs to be placed on designing exit legs to improve behaviors of both motorists and pedestrians. They commented that multilane roundabouts may require additional measures. Design changes could range from reductions in the exit radius to decreases

in lane widths. They made no suggestions relating to the setback distance between the pedestrian crosswalk and the roundabout.

A recent TCRP/NCHRP report, *TCRP Report 112/NCHRP Report 562: Improving Pedestrian Safety at Unsignalized Crossings* (*19*) provides a methodology for crossing treatments. It recommends that an uncontrolled crossing, with critical vehicle speed below 35 miles per hour, be carefully analyzed when pedestrian volumes exceed 20 in a peak hour. A crossing treatment can then be selected based upon pedestrian delay and expected motorist compliance. One treatment the NCHRP report highlights as being very effective is the median refuge islands, a treatment that is part of any roundabout installation and should not be omitted. Treatments that may well be applicable to crosswalks at roundabouts include: in roadway warning lights, flashing beacons, and nighttime lighting.

3.1.3. California Vehicle Code

The California Vehicle Code requires that motorists yield to pedestrians that are in a crosswalk. Further, the pedestrian is not allowed to step into a crosswalk when a vehicle is so close that the vehicle may constitute a hazard. The text of the relevant sections (21950 and 21952) are as follows: (*20*)

> "21950. (a) The driver of a vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at an intersection, except as otherwise provided in this chapter.
>
> " (b) This section does not relieve a pedestrian from the duty of using due care for his or her safety. No pedestrian may suddenly leave a curb or other place of safety and walk or run into the path of a vehicle that is so close as to constitute an immediate hazard. No pedestrian may unnecessarily stop or delay traffic while in a marked or unmarked crosswalk.
>
> " (c) The driver of a vehicle approaching a pedestrian within any marked or unmarked crosswalk shall exercise all due care and shall reduce the speed of the vehicle or take any other action relating to the operation of the vehicle as necessary to safeguard the safety of the pedestrian.
>
> " (d) Subdivision (b) does not relieve a driver of a vehicle from the duty of exercising due care for the safety of any pedestrian within any marked crosswalk or within any unmarked crosswalk at an intersection.
>
> "21952. The driver of any motor vehicle, prior to driving over or upon any sidewalk, shall yield the right-of-way to any pedestrian approaching thereon."

3.1.4. Pedestrians with Vision Disabilities

Pedestrians with vision disabilities face many challenges when navigating a street network. Roundabouts present particular challenges in navigation, gap detection, and yield detection. These challenges are not necessarily unique to roundabouts (they are common to most

unsignalized intersections), but some of the characteristics of the roundabout tend to exacerbate these challenges. These challenges are described further as follows:

- *Navigation.* One of the challenges facing pedestrians with vision disabilities is the task of navigating a roundabout. While the crosswalk distance is shorter, the total walk distance is longer because the crosswalks are set back from the roundabout.

- *Gap Detection.* Pedestrians with vision disabilities may also find it more difficult to identify gaps in roundabout traffic through observing sounds at roundabouts.

- *Yield Detection.* Pedestrians with vision disabilities often find it difficult to detect when a driver has yielded for them.

Clearly the provisions to deal with pedestrians with vision disabilities are issues that need attention (*21*).

The U. S. Access Board has made a number of draft recommendations regarding the accommodation of pedestrians with vision disabilities at roundabouts and other intersections (*21*). Planters are recommended to indicate crosswalk locations, and audible and accessible pedestrian signals of some type are recommended to help guide pedestrians with vision disabilities across the intersection. To address the issue of gap detection and yield detection at roundabouts, the U. S. Access Board indicates that the only practical solution at this time is to install some type of signalization to stop vehicles and allow pedestrians to cross. Water features should be avoided near roundabouts because they mask the sounds of cars. In addition, a raised crosswalk, with or without a raised guide strip at the centerline, may help pedestrians with vision disabilities remain aligned on the crosswalk.

Two major research efforts on the usability of roundabouts by pedestrians with vision impairments have been recently completed or are underway. In the first study, *Pedestrian Access to Roundabouts: Assessment of Motorists' Yielding to Visually Impaired Pedestrians and Potential Treatments to Improve Access*, Inman et al. described two studies intended to addresses two-lane roundabout accessibility issues for visually impaired pedestrians (*22*). The first study was conducted on a closed course to evaluate a pavement treatment designed to alert blind pedestrians when vehicles yielded to them. The second study examined drivers' yielding behaviors at a two-lane roundabout. The following is from the report abstract:

> In the first study, there were two experimental conditions: a control condition and a treatment condition in which rumble strip-like devices were placed on the roadway surface. Seven individuals who have severe visual impairments participated. Participants stood at a crosswalk and used hand signals to indicate when they detected vehicles stopping or departing after a stop. Compared to the control condition, the sound strips treatment increased the probability of detecting stopped vehicles, and decreased by more than a second the amount of time needed to make a detection; however, the treatment did not reduce the number of false detections. False detections could result in the pedestrian crossing when moving vehicles are approaching the crosswalk.

> The second study was an experiment conducted at an operating roundabout. In that environment the rumble strip-like treatment was not effective, probably because the majority of vehicles stopped in the circular roadway before crossing over the rumble strips. A Yield to Pedestrians, State Law sign that was placed in the roundabout exit between the two travel lanes resulted in an increase in drivers' yielding from 11 percent of vehicles in the control condition to 16 percent in the experimental condition.
>
> It was concluded that the treatments explored in these studies do not appear promising for double-lane roundabouts, but should be explored further to see if they might work at single-lane crossings.

No clear conclusions leading to design recommendations resulted from the studies done by Inman et al. The "yield to pedestrians" sign on a roundabout exit does hold some very modest opportunity to improve motorists' behavior.

The other major study, NCHRP Project 3-78, *Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities*, is currently underway and is expected to be complete in 2009. The project is using modeling and field studies to quantify and identify practical field solutions that can measurably improve accessibility of roundabouts and channelized turn lanes for pedestrians with vision disabilities. It is anticipated that these treatments may also impart benefits to sighted pedestrians.

In other research, Hughes (*23*) notes that automated yield detection can help meet the access goal for roundabout crosswalks. For automated yield detection, inductive loops detect the presence of vehicles blocking the crosswalk and vehicles yielding to pedestrians. Then accessible pedestrian signals with locator tones and audible messages are placed at a pedestrian-actuated, marked crosswalk upstream from the roundabout. The technology would help pedestrians with vision disabilities in the case of quiet cars. Yield detection or not, the likelihood of blind pedestrians accepting risky gaps points to a potential safety problem. From the perspective of the United States Access Board and the Americans with Disabilities Act, no pedestrians should experience access difficulties or be at risk (*21*). Automated yield detection is only theoretical at this point, and significant practical considerations need to be addressed prior to implementation.

3.1.5. Summary of Pedestrian Literature

This literature review indicates that pedestrians will generally receive a safety benefit when roundabouts are installed, although questions remain regarding usability in certain circumstances. For pedestrians, the risk of being involved in a severe collision is lower at roundabouts than at other forms of intersections due to the slower vehicle speeds, the lower number of conflict points, and the separation of entry and exit lanes by the splitter islands (*24*). On the other hand, roundabouts also bring challenges to users such as pedestrians with vision disabilities who may find it difficult to locate the crosswalks or determine vehicle gaps. The critical safety issues for pedestrians include pedestrian crossing position and treatments, splitter island design, sidewalk treatment, signing, and illumination. These issues need to be studied further, especially for pedestrians with vision disabilities.

3.2. Bicycle Literature

European experiences, reported over a decade ago, have indicated that single-lane and mini roundabouts do not appear to be particularly dangerous for bicyclists (*25*, *26*). Limited studies in the U.S. have shown a similar trend (*16*). However, the literature on bicycle safety at roundabouts is not totally consistent. Some European studies (specifically those conducted in the United Kingdom) indicated bicyclists are the most vulnerable at large roundabouts, especially multilane roundabouts. Bicyclists are involved in much higher rate of accidents at roundabouts as compared to conventional intersections (*27*, *28*, *29*). In addition, a study by Maycock and Hall (*6*) in the U.K. reported that a bicyclist is 14 to 16 times more likely than a car to be involved in a crash when using a roundabout. The study also indicated that large roundabouts (up to 70 m in diameter) are the most feared by bicyclists, although no statistical evidence is available to support the hypothesis. Peel collected a 3-year accident history at 35 roundabouts and 38 comparable signalized intersections in a British urban area and found out that the number of accidents per site involving bicycles is significantly higher at roundabouts than at signalized intersections (*30*). Other European countries identify similar mixed findings (*15*, *31*).

The most common (more than 50 percent) bicycle accidents at roundabouts involve conflicts between circulating bicyclists and entering vehicles (*32*, *33*). The primary cause of such accidents is drivers who fail to detect the bicycles mixed with the circulating traffic (*34*). Studies have shown that there is a strong correlation between collision speed and the risk of fatality. Lower vehicle speeds will improve driver's recognition of bicyclists and can also assist bicyclists to undertake their maneuvers within a roundabout, which can potentially reduce both numbers and severity of all user crashes (*35*). The lower vehicle speed also allows bicyclists to travel at or near the same speed as the motor vehicles. However, the smaller radii needed to produce lower speeds are often compromised to accommodate trucks.

Efforts have been taken to achieve lower speeds through innovative roundabout designs. Campbell and Dunn of New Zealand developed a conceptual "C" type multilane roundabout which aims at achieving speed of 30 km/h (*36*). The key design element is to narrow entry width to encourage bicyclists to travel in the center of the lane. The narrowed entry also prevents larger vehicles from attempting to enter the roundabouts alongside other vehicles. Fortuijn of the Netherlands proposed a turbo-roundabout design which aims to provide a compromised solution of accommodating large vehicles while reducing speed and conflicts at multilane roundabouts (*37*).

All the European countries identify that a more careful design is necessary to enhance the bicyclists' safety. In Europe, there are generally three alternatives to accommodate bicyclists at roundabouts: no designated bicycle facility, a bicycle lane within the circulatory roadway, or a bike path outside the roundabout. Studies have shown that a bicycle lane within the circulatory roadway results in the highest number of accidents (*16*, *26*). Providing a separate bicycle path has shown to be the safest for bicyclists; however, a bicycle path may not be used extensively when motorized vehicle traffic volume is low, as bicyclists traveling through are less likely to divert from the main roadway due to the number of stops and increased delay (*35*).

The current national Manual on Uniform Traffic Control Devices prohibits bicycle lane markings on the circulatory roadway of a roundabout (*38*, Section 3B-24). When no bicycle lane is

provided, bicyclists should be advised to ride in the center of the lane as if they were driving a motorized vehicle. The FHWA Roundabout Guide advises that because bicyclists have a range of abilities, designers should strive to accommodate that range by designing the roundabout so that bicyclists can circulate as either motorized vehicles (by sharing the lane) or as pedestrians (by sharing a sidewalk or multiuse path) (*1*). Note that the California Vehicle Code does not prohibit bicycle use on sidewalks, although it allows local agencies to regulate the operation of bicycles on sidewalks (CVC Section 21206).

With regard to roundabout design, one can refer to the *AASHTO Guide for Development of Bicycle Facilities* (*39*) for detailed design requirements for bicycle and shared-use path design. There is also a list of Australian guidelines (*25*) with recommendations for roundabout design for bicyclists. One guideline is that the line of sight should not be obstructed by landscaping, traffic signs, or poles that could even momentarily obscure a cyclist. More accidents associated with right-of-way conflicts involving cyclists occur when vehicle volume is 8,000 to 12,000 vehicles per day. The Netherlands introduced physical separators called "hedgehogs" to counteract the wide turning movements of trucks or swerving that caused cyclists to be hit. A hedgehog is a partition that consists of a narrow raised divided curb; they are built at the entry and exit and are properly spaced within the roundabout (*23*). These types of raised devices are currently prohibited in California due to concern over bicyclists hitting them and losing control (*4*, Section 1000).

As for the most recent U.S. experience, Harkey and Carter studied bicycle behavior as part of NCHRP 3-65 (*40*, also *7*). The key observations and findings include the following:

- Fourteen roadway approaches to roundabouts were observed, allowing researchers to observe 690 bicycle events. Only two of the approaches were multilane. The majority of bicyclists entering or exiting the roundabouts were positioned on the edge of the roadway. Circulating bicyclists often possessed the lane. Bicyclists' behaviors upon entering the roundabout posed virtually no safety problems in 238 observations.

- Only four conflicts were observed during the 690 bicycle event observations; these all occurred at single-lane roundabouts. No comparisons were made to any observed bicyclist and motorist interactions at conventionally controlled intersections.

- Harkey and Carter made two comments related to roundabout design. It was pointed out that European countries no longer design roundabouts with bicycle lanes on the outer edge of the circulatory roadway; with high motor vehicle speeds and bicycle volumes, separate cycling paths outside the perimeter of the roundabout may be required. They also commented that additional care to ensure bicyclist safety could be taken at the junction of the exit lanes and the circulatory lanes, which was identified as the location posing the greatest risks to bicyclists. They did not specify what type of "care" should be taken, other than to suggest that at higher volumes of vehicles and bicyclists it may be necessary to provide separate bicycle facilities outside the perimeter of the roundabout. This is already part of the current FHWA guidance to design a roundabout to allow cyclists to circulate as either vehicles or pedestrians (*1*).

3.3. Pedestrian and Bicyclist Demand at California Roundabouts

One of the questions of interest to Caltrans is whether the presence of a roundabout affects pedestrian and bicyclist demand at the intersection. The effect of roundabouts on pedestrian and bicyclist demand (i.e., does the roundabout cause pedestrians and bicyclists to change routes to avoid the intersection?) is not well documented in the literature, largely due to a lack of pedestrian and bicyclist volume count information in the period before conversion. The data presented in this section is intended to support a future research effort that would involve a before-and-after study of pedestrian and bicycle use at recently converted roundabouts in California.

Detailed pedestrian and bicyclist counts were conducted in May and June of 2006 at ten conventional intersections throughout California where conversions to a roundabout were likely to happen in the near future. The locations were selected because there is a definite likelihood that the conventional intersection will be reconstructed into a roundabout in the near future. The pedestrian and bicyclist numbers varied at each location. Several other characteristics of the intersections, such as the size and lane width, also varied by location. Efforts were made to find locations near state highways that have a large volume of pedestrian and bicyclist activities, although such locations are very scarce. When choosing a location, satellite pictures were used to determine the setting and nature of land developments in the area. Locations were selected that might be attractive to pedestrian and bicycle traffic. Table 10 lists the selected intersections.

Table 10. Pedestrian and Bicyclist Counts at Proposed Future Roundabouts

City	Intersection	# Of Pedestrians	# Of Bicycles	Total
Oroville	Washington Avenue/Montgomery Street	64	23	87
Modesto	Sylvan Avenue/Roselle Avenue	2	5	7
Fresno	Fresno Street/North Fresno Street/Divisadero Street	172	18	190
Watsonville	Main Street/Freedom Boulevard	96	26	122
Santa Cruz	Beach Street/Pacific Avenue	1009	342	1351
Palmdale	47th Street East/State Route 138	0	1	1
Paso Robles	Highway 46 West/Route 101	2	0	2
Berkeley	Gilman Street/I-80	98	37	135
Truckee	Alder Drive/Prosser Dam Road	1	17	18
Kings Beach	Bear Street/State Route 28	270	64	334
	Total	**1714**	**533**	**2247**

The counts were set up to record 16 different movements—12 bicycle movements and four pedestrian movements. For the bicycle movements, it was noted what direction the bicyclist was traveling and if the bicyclist was turning left, right, or proceeding straight. The pedestrian movements identified the crosswalk the pedestrian used. The counts took place between the hours of 2:30 p.m. and 6:00 p.m., and were conducted on days when schools were in session.

For sites where the intersection is reconstructed into a roundabout, another count needs to be conducted to determine whether pedestrian and bicyclist demand changes with the presence of a

roundabout. When conducting the counts, it is important that the population growth in the area be examined so that proper adjustments can be made.

3.4. Pedestrian and Bicycle Behavior at California Roundabouts

Pedestrian and bicyclist characteristics in these roundabouts were examined from videos of roundabouts in California collected as part of this project. Pedestrian and motorist behaviors were examined where pedestrians encountered motorists while crossing an intersection. Bicyclist behaviors when encountering a motorist were also recorded. The intersection characteristics were recorded as the bicyclist entered and circulated the roundabout.

3.4.1. Method for Video Data Analysis

Tables were created from the video analysis to characterize how pedestrians and bicyclists interact with motorists in roundabouts. The recordings of existing roundabouts in California were provided by this project and the NCHRP 3-65 project. The locations where roundabouts were examined were exclusively in California: Davis, Modesto, and Santa Barbara. The roundabouts in Davis and Modesto are single-lane roundabouts, whereas the roundabout in Santa Barbara is a multilane roundabout. The guidelines for the tables used in this study were taken from the studies prepared under NCHRP 3-65 by Harkey and Carter (*18*, *40*).

Data analysis sheets for the bicyclists and pedestrians were created from the videos. The data sheets contain all of the data that are provided in the report and emphasized events where the pedestrian or bicyclist had an interaction with a motorist. An event occurs when the roundabout is being used by either a pedestrian or a bicyclist. Table 11 and Table 12 provide summaries of the bicycle and pedestrian observations, respectively. Roundabout characteristics for the sites observed are included in the two tables.

Table 11. Roundabout Bicycle Observations

City	Intersection	Observation Period (min)	Bicycle Events	Average Daily Traffic	Circulatory Lanes	Approach Lanes	Crossing Distance (ft)	Splitter Island Width (ft)
Davis, CA	Anderson Rd./Alvarado Ave.	99	420	8900	1	1	50	15
		120	99		1	1	50	15
Santa Barbara, CA	Milpas St./ US 101 NB Ramps/ Carpinteria St.	120	573	No Data	2	2	48	12
Modesto, CA	La Loma St./James St.	90	26	No Data	1	1	No Data	No Data

Table 12. Roundabout Pedestrian Observations

City	Intersection	Observation Period (min)	Pedestrian Events	Average Daily Traffic	Circulatory Lanes	Approach Lanes	Crossing Distance (ft)	Splitter Island Width (ft)	Install Date
Davis, CA	Anderson Rd./Alvarado Ave.	99	272	8900	1	1	50	15	1997
		120	25		1	1	50	15	
Santa Barbara, CA	Milpas St./ US 101 NB Ramps/ Carpinteria St.	120	643	No Data	2	2	48	12	2000
Modesto, CA	La Loma St./James St.	90	10	No Data	1	1	No Data	No Data	1997

3.4.2. Distribution of Bicyclists by Lane Position

Table 13 depicts the position that the bicyclist was in as he/she entered, circulated, and exited the roundabout. The majority of bicyclists traveled on the edge of the lanes when traveling in the roundabout. For a bicyclist to possess the lane, they needed to travel in the middle of the lane in such a way that motorists could not safely pass them. At the multilane roundabout in Santa Barbara, at the multilane roundabout, more bicyclists chose to circulate using the sidewalk and the crosswalk.

Table 13. Numbers of Bicyclist by Position at the Roundabouts

Position of Bicyclist of Event Type or Maneuver at the Roundabout									
	Entering Roundabout			Exiting Roundabout			Circulating		
Location	Bicyclists on Edge of Lane	Bicyclists Possessing Lane	Bicyclists on Sidewalk	Bicyclists on Edge of Lane	Bicyclists Possessing Lane	Bicyclists on Sidewalk	Bicyclists on Edge of Lane	Bicyclists Possessing Lane	Bicyclists on Sidewalk
Davis, CA	147	10	6	135	7	11	125	54	14
Santa Barbara, CA	53	5	3	133	4	1	78	19	229
Modesto, CA	7	0	0	6	0	0	3	2	8

Table 14 further elaborates the distribution of bicyclists by lane position, breaking down the percentage of how often the bicyclist rode on the edge of the lane, possessed the lane, or used the sidewalk while entering, circulating, and exiting the roundabout.

Table 14. Percentages of Bicyclists by Position at the Roundabouts

Distribution of Bicyclists by Lane Position			
Location	**Edge of Lane**	**Possessing Lane**	**Sidewalk**
Davis, CA	80.0%	13.9%	6.1%
Santa Barbara, CA	50.3%	5.3%	44.4%
Modesto, CA	61.5%	7.7%	30.8%
Total	64.8%	9.5%	25.7%

3.4.3. Distribution of Bicyclist Positions by Vehicle Presence

Table 15 provides the bicyclist position relative to the motorists when both were traveling in the roundabout. The types of motorists present were classified where a bicyclist was either leading or trailing a motor vehicle, if the bicyclist was within two car lengths. Most of the bicyclists were not affected by a motorist's presence. Few bicyclists possessed the lane when motorists were present. According to these data, 17 (22.7%) out of 75 bicyclists in roundabouts in California possessed the lane.

Table 15. Distribution of Bicyclist Positions within Roundabout by Vehicle Position

Motor Vehicle Presence	**Edge of Lane/ Shoulder/ Bike Lane**		**Possessing Lane**		**Total**	
	Count	**Percent**	**Count**	**Percent**	**Count**	**Percent**
None	629	88.3%	83	11.7%	712	100.0%
Leading	38	74.5%	13	25.5%	51	100.0%
Trailing	15	93.8%	1	6.3%	16	100.0%
Both Leading and Trailing	5	62.5%	3	37.5%	8	100.0%
Total	687	87.3%	100	12.7%	787	100.0%

3.4.4. Bicyclist Movements When Entering a Roundabout

Table 16 presents the type of movements bicyclists made when entering the roundabout, categorized by entering the roundabout without stopping, waiting before entering the roundabout, or entering using the sidewalk. As can be seen, most bicyclists were observed to enter the roundabout without stopping. The lower percentage observed at Modesto is largely influenced by the small sample size.

Table 16. Bicycle Movements When Entering the Roundabout

Location	Entering Circulation Without Stopping		Waiting Before Entering Circulatory Lanes		Entering on Sidewalk		Total	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Davis, CA	135	82.8%	22	13.5%	6	3.7%	163	100.0%
Santa Barbara, CA	50	82.0%	11	18.0%	0	0.0%	61	100.0%
Modesto, CA	4	57.1%	3	42.9%	0	0.0%	7	100.0%
Total	189	81.8%	36	15.6%	6	2.6%	231	100.0%

3.4.5. Bicyclist and Motorist Behavior at Crosswalks by Entry Leg and Exit Leg

Many bicyclists entered the roundabout by crossing at the pedestrian crossing. Table 17 and Table 18 present bicyclists' and motorists' behaviors, respectively, when the bicyclist entered the roundabout at the crosswalk.

Table 17. Bicyclist Behavior at Crosswalk by Entry Leg and Exit Leg

Bicyclist's Behavior	Entry Leg		Exit Leg	
	Count	Percent	Count	Percent
Normal	174	90.6%	117	84.2%
Waits/ Hesitates before starting	17	8.9%	19	13.7%
Hesitates after starting	1	0.5%	3	2.2%
Total	192	100.0%	139	100.0%

Table 18. Motorist Behavior at Crosswalk by Entry Leg and Exit Leg

Motorist's Behavior	Entry Leg		Exit Leg	
	Count	Percent	Count	Percent
No Motor Vehicle Present	126	63.6%	123	90.4%
Slows or Stops for a waiting Bicycle	2	1.0%	2	1.5%
Slows or Stops for bicycle in Transit	27	13.6%	11	8.1%
Already Stopped	43	21.7%	0	0.0%
Total	198	100.0%	136	100.0%

Technically, any bicyclist entering the roundabout from the sidewalk is expected to yield the right-of-way to the motorist in the entry or exit leg. The situation is legally comparable to a

motorist merging to a roadway from a driveway. If the bicyclist is dismounted, the motorist is expected to yield to the pedestrian guiding the bicycle. In this study, when a bicyclist entered the roundabout without having to stop or hesitate, the behavior was classified as "normal." In most of the observed cases, the bicyclist exhibited normal behavior as he/she used an acceptable gap in motor vehicle traffic. If the bicyclist waited or hesitated to enter the roundabout, the action was classified as "waits/hesitates before starting." If the bicyclist started to enter the roundabout then hesitated, the action was classified as "hesitates after starting."

Most bicyclists were able to use the crosswalk without any conflict with motorists. One bicyclist/motorist conflict occurred when a bicyclist was cut off while trying to enter the roundabout, which forced the bicyclist to come to an abrupt stop. A second bicyclist/motorist conflict occurred when a bicyclist entered a crosswalk and the motorist had to swerve around the bicyclist to avoid collision. One borderline conflict occurred when the bicyclist entering the crosswalk and a conflicting motorist had to brake abruptly to avoid each other.

Table 17 shows the motorists' behaviors when interacting with bicyclists. The results are broken down by interactions that occurred at the entry and exit legs. The biggest difference was that on the entry leg and at multilane roundabouts, there were more cars already stopped than at the exit lane and at single-lane roundabouts. There were four classifications used to categorize the motorists' behavior: no motor vehicle present, motor vehicle slows or stops for waiting bike, motor vehicle slows or stops for bike in transit, and motor vehicle already stopped.

There is no requirement for the motorist to yield to the bicyclist. However, Table 18 indicates that many motorists did. The events of a motorist passing a waiting bicyclist were not tabulated.

3.4.6. Pedestrian Crossings with Vehicle Interaction

Table 19 compares where pedestrians encountered motorists when using a roundabout. The pedestrians had an interaction either at the entry or exit leg of the roundabout: each was recorded and depicted in the table. The third column of the table breaks down the percentage of interactions between pedestrians and motorists within each roundabout location. For example, in the roundabout located in Davis, 16.5% of the pedestrian's crossing at the crosswalk had some sort of vehicle interaction. The remaining 83.5% did not. The fifth and seventh columns of the table break down the percentage of interactions on the entry and exit leg for each of the roundabouts. In Davis, of the 16.5% that had vehicle interaction, 69.4% of the interactions occurred on the entry leg and 30.6% of the interactions occurred on the exit leg.

Table 19. Pedestrian Motor Vehicle Interactions at Crosswalks

Location	% of Pedestrian Crossings with Vehicle Interaction		% of Interactions on Entry Leg		% of Interactions on Exit Leg	
	Count	Percent	Count	Percent	Count	Percent
Davis, CA	49	16.5%	34	69.4%	15	30.6%
Santa Barbara, CA	312	48.5%	240	76.9%	72	23.1%
Modesto, CA	3	30.0%	3	100.0%	0	0.0%

3.4.7. Pedestrian's Behavior when Crossing in Roundabout

As pedestrians used the crosswalk, their actions were broken down into four different categories: normal, hesitates, retreats, and runs. Normal behavior was defined as a person who used the crosswalk without hesitating, running, or retreating back to the sidewalk. The pedestrian behaviors are presented in Table 20.

For a pedestrian to hesitate when using a crosswalk, the pedestrian either had to have an unnecessary long pause before entering when no cars were present or have a pause after starting to enter the roundabout. The classification "runs" is when a pedestrian rushed across in a very fast manner that was unlike their approach to the roundabout. A jogger was counted as a pedestrain with normal behavior. "Other than normal" behavior occurred more frequently at the multilane roundabout crossings than at the single-lane roundabout crossings.

Table 20. Pedestrian Behavior when Crossing in Roundabout

Location	Normal		Hesitates		Retreats		Runs	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Davis, CA	289	97.3%	4	1.3%	0	0.0%	4	1.3%
Santa Barbara, CA	600	93.3%	22	3.4%	2	0.3%	19	3.0%
Modesto, CA	9	90.0%	1	10.0%	0	0.0%	0	0.0%
Total	898	94.5%	27	2.8%	2	0.2%	23	2.4%

3.4.8. Crossing Location

Pedestrians do not always stay in the crosswalk. Table 21 classifies where the pedestrian crossed when traveling around the roundabout. A pedestrian could cross completely in the crosswalk, start in the crosswalk and then stray outside the crosswalk before reaching the other side, start off the crosswalk but then enter the crosswalk at mid-span, or cross off the crosswalk. It appears that in single-lane crossings, it is more likely that the pedestrians will not use the crosswalk at all. At the multilane crossings, pedestrians used part of the crosswalk more often than at the single-lane crossings.

Table 21. Pedestrian Crossing Location

Location	Crosswalk		In-Entry/Out-Exit		Out-Entry/In-Exit		Off Crosswalk	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Davis, CA	152	51.2%	6	2.0%	20	6.7%	119	40.1%
Santa Barbara, CA	470	73.1%	111	17.3%	18	2.8%	44	6.8%
Modesto, CA	9	90.0%	0	0.0%	0	0.0%	1	10.0%
Total	631	66.4%	117	12.3%	38	4.0%	164	17.3%

3.4.9. Motorist's Yield Behavior

When a motorist had an interaction with a pedestrian, the motorist's actions were classified as an active yield, a passive yield, or did not yield. An active yield is where a motorist slows or stops for a pedestrian waiting to cross; the pedestrian is the reason that the motorist stops or slows. A passive yield is where a motorist yields to the pedestrian but is already stopped for another reason. This happened more in the multilane roundabout when motorists had to wait to enter. The last classification, did not yield, is when a pedestrian makes a motion to enter the roundabout but the motorist proceeds without yielding. As noted previously, the California Vehicle Code requires that motorists yield to pedestrians that are in a crosswalk.

Table 22 depicts driver behaviors when a pedestrian starts the crossing on the roundabout entry leg. Table 23 provides the same information for the case when the pedestrian begins the crossing on the roundabout exit leg. Table 24 provides the percentages for the combined entry legs and exit legs crossings.

Table 22. Motorist Yield Behavior, Pedestrian Start on Entry Side

Location	Behavior on Entry Leg			Behavior on Exit Leg		
	Active Yield	Passive Yield	Did Not Yield	Active Yield	Passive Yield	Did Not Yield
Davis, CA	7	0	0	15	0	1
Santa Barbara, CA	52	29	0	17	0	2
Modesto, CA	1	0	0	0	0	0
Total	60	29	0	32	0	3

Table 23. Motorist Yield Behavior, Pedestrian Start on Exit Side

Location	Behavior on Entry Leg			Behavior on Exit Leg		
	Active Yield	Passive Yield	Did Not Yield	Active Yield	Passive Yield	Did Not Yield
Davis, CA	25	0	3	2	0	0
Santa Barbara, CA	39	38	0	46	0	6
Modesto, CA	1	0	0	0	0	0
Total	65	38	3	48	0	6

Table 24. Motorist Yield Behavior Percentages

Location	Behavior on Entry Leg			Behavior on Exit Leg		
	Active Yield	Passive Yield	Did Not Yield	Active Yield	Passive Yield	Did Not Yield
Davis, CA	91.4%	0.0%	8.6%	94.4%	0.0%	5.6%
Santa Barbara, CA	57.6%	42.4%	0.0%	88.7%	0.0%	11.3%
Modesto, CA	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	64.1%	34.4%	1.5%	89.9%	0.0%	10.1%

3.4.10. California Compared to National Data

The data that was tabulated for California showed some similarities and some differences to studies by Harkey and Carter (*18*, *40*). As with Harkey and Carter, the research found no major safety problems that needed to be addressed for bicyclists and pedestrians at the roundabouts. However, there were differences in many of the numbers, which is to be expected with the data being taken at different roundabouts and times.

The bicyclists' position in roundabouts produced different results, but no statistical conclusion can be drawn from the differences given the limited amount of data available, nor is it possible to definitively draw separate conclusions for single-lane and multilane roundabouts. An example of the difference is that Harkey and Carter concluded that 54 percent of bicyclists rode on the edge of the roundabouts; the California data revealed that 65 percent of the bicyclists rode on the edge of the roundabouts. Harkey and Carter stated that 28 percent of bicyclists possessed the lane, whereas the California data revealed only 10 percent. While some of that difference probably came from the different roundabouts and times studied, additional differences may have come from the observer's discretion of what exactly was counted as possessing the lane. There were times when lane possession was very clear but at other times, a bicyclist would be riding in an area where it was hard to determine whether they possessed the lane or were on the edge of the lane. The data were all determined from video of the roundabouts, and there were times where the angles on the camera made it hard to clearly determine positions.

The major conclusions that can be drawn from the combined national and California video observation data of pedestrians and bicycles are:

- The exit legs are the greatest risk for pedestrians because motorists are less likely to yield.
- Two-lane approaches are more difficult for pedestrians to cross than one-lane approaches; motorists are less likely to yield.
- Behavior of motorists and pedestrians at roundabout crosswalks appear to be consistent with that at other types of crosswalks, with better driver yielding behavior at roundabouts than at uncontrolled crosswalks but not as good as at signal- or stop-controlled crosswalks.

- When approaching a roundabout, more bicyclists travel at the edge of the lane with only a small number possessing the lane or using the sidewalk. When exiting the roundabout, the number of bicyclists using the sidewalks increases but the number of bicycles possessing the lane stays constant.

- In the event that a bicyclist might be traveling outside the travel lane when circulating the roundabout, instead of possessing the lane, no other interactions were observed. Bicyclists nearly always wait until there are no vehicles approaching the roundabout before crossing.

- Concern of wrong-way riding where the bicyclists enter the roundabout from the exit leg should be addressed to avoid collisions.

- Care must be considered for vehicle yielding behaviors to ensure that the motorists will yield to waiting and crossing pedestrians. Roundabouts need to be designed to provide adequate sight lines and to reduce vehicle speed at the exits. Multilane roundabouts may require additional design elements (e.g., pedestrian signals of some type or other treatments beyond a simple marked crosswalk) to improve accessibility for all users; these are currently being researched under NCHRP 3-78.

3.5. Traffic Collision Data

This section discusses the collision data from roundabouts at eight different roundabouts: four from Colorado, one from California, one from Washington, one from Maryland, and one from Michigan. The collisions studied were those provided in NCHRP 3-65 that involved pedestrians and bicyclists. Between 1996 and 2003 (not all years were available for all sites), thirteen pedestrian and bicyclist collisions occurred in the eight roundabouts. By looking at where the accidents occurred in the roundabouts, design recommendations may be made for future and current roundabout design.

Of the 13 collisions reported, 7 were between pedestrians and motorists and 6 were between bicyclists and motorists. The collisions occurred between the hours of 9:00 a.m. and 7:30 p.m., making lighting a generally insignificant issue. Seven occurred in the roundabout entry, 3 occurred in the roundabout exit, and 3 occurred in the roundabout itself. There were no fatal collisions, but 11 of the 13 collisions resulted in injuries.

This data sample is very small and a larger sampling is needed to make usable statistics. As more roundabouts are built, more data in the United States will be available in the future. The data shows more incidents on the entry leg than the exit leg, which is unexpected. Due to the small sample size, not much can be said other than visibility should be checked at those roundabouts to determine if the stopping sight distance is sufficient for incoming vehicles.

4. GEOMETRIC DESIGN CONSIDERATIONS

This chapter presents geometric design guidance for roundabouts based on the latest research available. First, a discussion of general design philosophy is presented, followed by discussions on specific topics. This chapter is not intended to be a complete document covering all aspects of roundabout design, nor does it cover important topics such as policy, planning, operational performance estimation, or safety performance estimation. Rather, this document presents a focused discussion on particular topics of interest to Caltrans that can be used by the agency in addition to FHWA's *Roundabouts: an Informational Guide* (*1*, hereafter FHWA Guide) and other documents to update Design Information Bulletin 80 (*3*) and the Highway Design Manual (*4*).

4.1. Review of Existing Guidelines

As more roundabouts are being built in the U.S., several states have initiated roundabout-related research and developed some type of roundabout application guidelines. In 2000, the FHWA published the first national-level roundabout guide in the United States (*1*). Several states have also developed state-level guidelines as a supplement to the FHWA Roundabout Guide; these are listed in Table 25.

Table 25. Published Guidelines and Research Documents

State	Name of Document	Year of Publication
Maryland	Roundabout Design Guidelines (*41*)	1995
Oregon	Modern Roundabouts for Oregon (*42*)	1998
Florida	Florida Roundabout Guide (*43*)	1998
Pennsylvania	Guide To Roundabouts (*44*)	2001
New York	Highway Design Manual, Chapter 26: Roundabout (*45*)	2001
California	Design Information Bulletin 80-01 (*3*)	2003
Kansas	Kansas Roundabout Guide: a Supplement to FHWA's Roundabout: an Informational Guide (*2*)	2003
Arizona	Roundabouts: an Arizona Case Study and Design Guidelines (*8*)	2003
Washington	WSDOT Highway Design Manual, Chapter 915 (*46*)	2004
Wisconsin	Facilities Development Manual, Design Chapter, Roundabouts Section (*9*)	2004
Utah	Evaluation of Four Recent Traffic and Safety Initiatives: Volume 1: Developing Guidelines for Roundabouts (*10*)	2005
Kentucky	Modern Roundabouts: a Guide for Application (*47*)	2005

As shown in the table, two states (Florida and Maryland) had developed guidelines and one state (Oregon) had conducted research before the publication of the FHWA Guide. These guidelines were mainly based on information from international studies and guides. The states that published guidance after the publication of the FHWA Guide have typically used the FHWA Guide as their primary reference. However, some documents have deviated from the FHWA Guide on several design and operating parameters, as documented in the following sections. The geometric design parameters include design vehicle, design speed, and inscribed circle diameter. Critical gap is addressed as an operating parameter, although it is used to calculate sight distance at roundabouts.

4.2. General Design Philosophy

The successful design of roundabouts, as with any intersection type, requires attention to how the components of the intersection fit together, as well as to how the intersection fits within the surrounding transportation system. It is insufficient, for example, to assume that the assembly of components using standard dimensions will result in a successful intersection. For example, a standard, four-legged intersection with through lanes and left-turn lanes that are 12 feet and 14 feet wide, respectively, meets most acceptable standards. If, however, the through lane on one approach is misaligned with the receiving lane on the opposite side of the intersection, the resulting composition of the intersection may result in an unacceptable crash experience. In addition, a similar intersection with 10-foot lanes but good alignment through the intersection may have a better crash experience than the misaligned intersection with standard lane widths, even though the intersection lane widths do not meet the standard for that component. Therefore, attention to the overall layout of the intersection is often more critical than the dimensions of individual components. In effect, roundabout design is performance-based; that is, success is measured from its output (operational and safety performance, accommodation of design vehicle, pedestrian and bicycle usability, etc.) rather than its input (individual design dimensions).

The guidance presented in this chapter is presented with this overall philosophy in mind. Each component is anchored to available research wherever possible; in other cases, the guidance represents the best judgment of the authors. Tables and figures have been provided to illustrate key points.

4.3. Lane Numbers and Arrangements

The overall number of lanes entering, circulating, and exiting a roundabout is the most important factor in determing the capacity of the intersection. In addition, the number of lanes has a direct influence on the safety of the intersection. Entries with more lanes provide capacity, but often at the expense of safety.

4.3.1. Methods and Considerations

A variety of operational analysis methods are available to determine appropriate lane numbers and arrangements. A detailed discussion of operational analysis methods, including specific software implementations, is beyond the scope of this document. The operational methods can be generalized into three basic categories:

- *Simple deterministic methods.* These include the simple linear equations presented in the FHWA Guide and the simple exponential regression equations developed within NCHRP 3-65 (*7*). These methods can be conducted either manually or with simple spreadsheets and are often sufficiently accurate for many applications. In addition, the research from NCHRP 3-65 suggests that simple methods can be supported by U.S. data at this time.

- *Complex deterministic methods.* These methods have more complicated mathematical models and iterative procedures that must be implemented by software. These models allow more tests of sensitivity to flow patterns and/or geometry. Examples include but are not limited to the methods presented in SIDRA and RODEL. These methods can be calibrated to U.S. data, although NCHRP 3-65 research could not conclude that the calibrated complex methods were more accurate than simple methods.

- *Microsimulation models.* These models account for individual vehicle behavior and thus are more complicated than the deterministic models identified above. Microsimulation models are also typically capable of modeling network effects, which allows for modeling of interactions between a roundabout and other nearby traffic control devices. Examples include but are not limited to VISSIM and Paramics.

From a design perspective, safety and operational performance are maximized by ensuring that lane numbers and arrangements are consistent throughout the design of the roundabout. For single-lane roundabouts, these are self-evident. However, for multilane roundabouts, lane numbers and arrangements become much more complex. By maintaining consistent lane numbers and arrangements throughout the roundabout, lane changes within the intersection are minimized and allow the roundabout to operate consistent with general driving practice at other intersections, where lane changes within the intersection are generally not desirable (although not specifically prohibited by the California Vehicle Code). For example, if two entry lanes are required for a particular turning movement for capacity reasons, these two lanes need to be carried through the circulatory roadway and exit to avoid unnecessary merging within the roundabout, which may result in less capacity and safety than could be achieved.

The next update to FHWA's *Manual on Uniform Traffic Control Devices* (*38*) is expected to contain examples of circulatory roadway striping arrangements that illustrate these points. Two examples of these that were approved by the National Committee on Uniform Traffic Control Devices in January 2006 are given in Figure 11 and Figure 12. Both roundabouts have two entry lanes on all approaches. However, the roundabout in Figure 12 has double-left turn movements for two approaches, presumably to accommodate heavy left-turn movements on those approaches. To accommodate these movements without inducing lane changing within the roundabout, a section of three-lane circulatory roadway is needed, as well as a single lane for the exit that has only one lane feeding it. By tracing the path of a vehicle in each lane, one can see that no lane changes are generally necessary within the roundabout, provided that a vehicle starts in the correct lane as assigned by the lane use arrows on the approach.

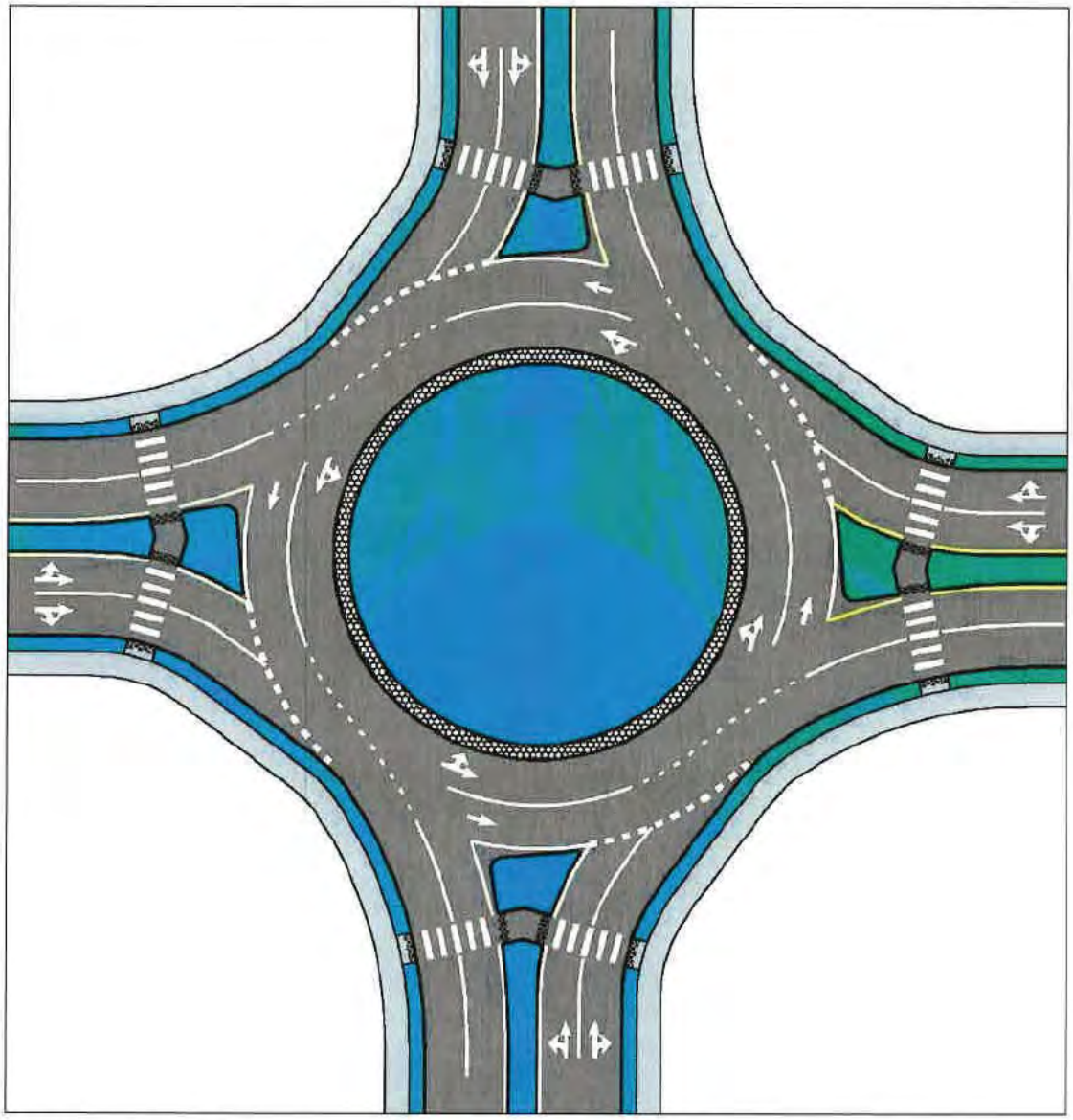


Figure 11. Lane Numbers and Arrangements for Typical Double-Lane Roundabout

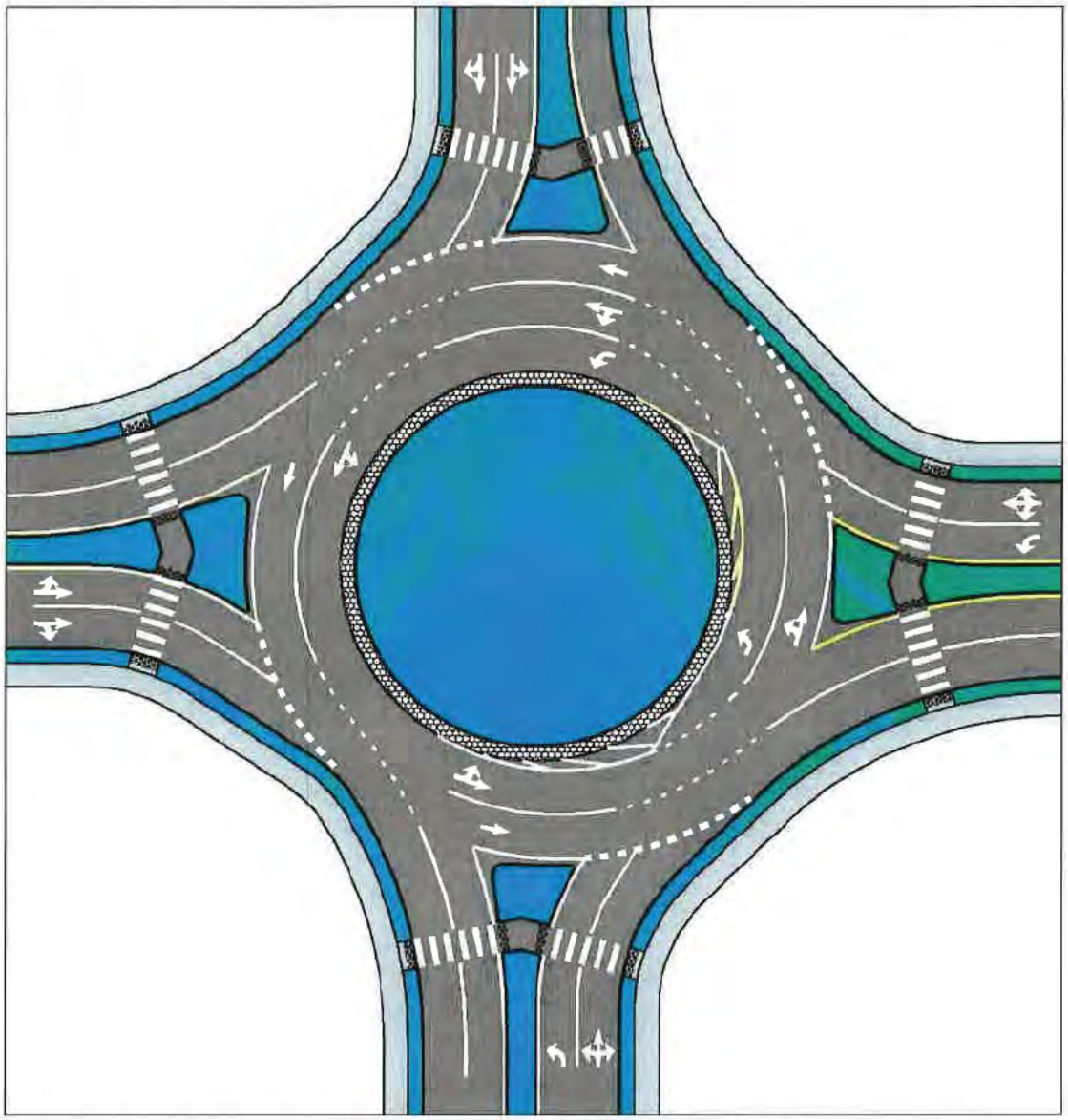


Figure 12. Lane Numbers and Arrangements for Roundabout with Consecutive Double-Left Turns

Under some circumstances, particularly for complex multilane roundabouts with more than four legs, it may be impossible to provide for every movement through the roundabout without lane changes. If these circumstances cannot be avoided, the designer should recognize that the lane changes within the roundabout run a higher risk of side-swipe crashes, poor entry lane utilization, and/or lower entry capacity. In these cases, a designer may need to omit circulatory lane striping in those portions of the circulatory roadway where their presence may induce undesirable safety and operational performance (this is referred to as partial circulatory roadway striping). These decisions must be made on a case-by-case basis; it is difficult to prescribe a set of conditions under which partial circulatory roadway striping will be necessary. However, poor

striping may have more adverse safety consequences than no striping, so in some cases it may be preferable to not stripe at all rather than to put down stripes that induce conflicts.

4.3.2. Capacity Models Calibrated to California Data

Using the critical headway and follow-up headway values identified in Chapter 2, it is possible to calibrate the capacity equations recommended in the NCHRP 3-65 research.

- The following California-specific values for critical headway may be considered for calibration of capacity models to determine appropriate lane numbers and arrangements:
  - Single-lane roundabouts: 4.8 s
  - Multilane roundabouts: 4.7 s, left lane; 4.4 s, right lane
- The following California-specific values for follow-up headway should be considered for calibration of capacity models to determine appropriate lane numbers and arrangements:
  - Single-lane roundabouts: 2.5 s
  - Multilane roundabouts: 2.2 s, left lane; 2.2 s, right lane

The NCHRP 572 research provides the following general form for estimating capacity:

$$c = A \cdot \exp(-B \cdot v_c) \quad (1)$$

where: c = capacity (passenger car equivalents per hour),

v_c = conflicting flow rate (passenger car equivalents per hour),

A = $3600/t_f$,

B = $(t_c - t_f/2)/3600$,

t_c = critical headway (seconds), and

t_f = follow-up headway (seconds).

Using this general form and the California data described above,

A = 3600/2.5 = 1440 for single-lane

A = 3600/2.2 = 1640 for multilane.

B = (4.8 – 2.5/2)/3600 = 0.0010 for single-lane

B = (4.4 – 2.2/2)/3600 = 0.0009 for multilane right lane

B = (4.7 – 2.2/2)/3600 = 0.0010 for multilane left lane

Therefore, the calibrated capacity equations are given as follows in Equations 2, 3, and 4, with c equal to capacity (passenger car equivalents per hour) and v_c equal to the conflicting flow rate (passenger car equivalents per hour):

- Single-lane: $c = 1440 \cdot \exp(-0.0010 \cdot v_c)$ (2)
- Multilane right lane: $c = 1640 \cdot \exp(-0.0009 \cdot v_c)$ (3)
- Multilane left lane: $c = 1640 \cdot \exp(-0.0010 \cdot v_c)$ (4)

4.4. Design Speed

The design speed of a roundabout is widely recognized as one of its most important attributes in terms of safety performance. Generally speaking, although the frequency of crashes is most directly tied to volume, the severity of those collisions is more directly correlated to speed. Therefore, careful attention to the design speed of a roundabout is fundamental to attaining good safety performance.

This section is divided into two parts. The first part discusses a methodology for estimating various speeds through a roundabout, and the second part discusses desirable thresholds for those speeds.

4.4.1. General Speed Estimation

The speed prediction formula presented in the FHWA Guide is based on the basic highway design principles found in the AASHTO *Policy on Geometric Design of Streets and Highways (48)*. The basic relationship between speed, radius, superelevation, and side friction factor is as follows:

$$V = \sqrt{15R(e + f)} \quad (5)$$

where V = speed (mph),

R = radius (ft),

e = superelevation (ft/ft), and

f = side friction factor.

The FHWA Roundabout Guide presents its speed methodology using a series of graphs to demonstrate the relationship among these parameters, recognizing that side friction factor varies with speed. NCHRP 3-65 researchers developed a simplified relationship between speed and radius for the two most common superelevation values, e = +0.02 and e = –0.02 *(7)*. These fitted equations are as follows:

$$V = 3.4415R^{0.3861}, \text{ for e} = +0.02 \quad (6a)$$

$$V = 3.4614R^{0.3673}, \text{ for e} = -0.02 \quad (6b)$$

where V = predicted speed (mph), and

R = radius of curve (ft).

The NCHRP 3-65 researchers found that the above relationships provide a reasonable prediction for the left-turn and through movement circulating speeds. However, the researchers found that current methodologies significantly overpredict entry and exit speed in cases where the path radius is large.

4.4.2. Exit Speed

To improve the prediction fit for exit speeds, the NCHRP 3-65 researchers proposed the following formulation:

$$V_3 = \min\left\{ V_{3pbase},\ \frac{1}{1.47}\sqrt{(1.47V_2)^2 + 2a_{23}d_{23}} \right\} \quad (7)$$

where V_3 = exit speed (mph),

V_{3pbase} = V_3 speed predicted based on path radius (mph),

V_2 = circulating speed for through movements predicted based on path radius (mph),

a_{23} = acceleration along the length between the midpoint of V_2 path and the point of interest along V_3 path = 6.9 ft/s^2, and

d_{23} = distance between midpoint of V_2 path and point of interest along V_3 path (ft).

This formulation suggests that tangential exits do not inherently result in excessive exit speeds as compared to exits with some curvature, provided that circulating speeds are low and the distance to the point of interest on the exit (typically the crosswalk) is short. While the authors believe it is desirable to provide some degree of curvature on the exit to reduce the visual appearance of a "straight shot," such curvature does not appear to always be the controlling factor for exiting speeds.

In practice, the use of exits with broad curvature or tangential alignments becomes more critical for roundabouts with multilane exits. It may be possible, for example, to use a smaller inscribed

circle diameter with tangential exits than what might be possible with exits with more curvature. The smaller diameter may result in lower circulating speeds and lower exiting speeds. As with all elements of roundabout design, the authors believe that the most important principle is that the components fit together to achieve a desired result.

4.4.3. Entry Speed

To improve the prediction fit for entry speeds, the NCHRP 3-65 researchers proposed the following formulation:

$$V_1 = \min\left\{ V_{1pbase},\ \frac{1}{1.47}\sqrt{(1.47V_2)^2 - 2a_{12}d_{12}} \right\} \quad (8)$$

where V_1 = entry speed (mph),

V_{1pbase} = V_1 speed predicted based on path radius (mph),

V_2 = circulating speed for through vehicles predicted based on path radius (mph),

a_{12} = deceleration between the point of interest along V_1 path and the midpoint of V_2 path = –4.2 ft/s^2, and

d_{12} = distance along the vehicle path between the point of interest along V_1 path and the midpoint of V_2 path (ft).

The NCHRP 3-65 researchers noted that the proposed entry-speed prediction method appears to be a substantial improvement on the current method. However, given the hesitancy presently exhibited by drivers under capacity conditions, the observed entry speeds may increase over time after drivers acclimate further. Therefore, they noted their belief that a designer should be cautious when using deceleration as a limiting factor to establish entry speeds for design. Furthermore, they noted their belief that a good design should rely more heavily on controlling the R_1 path radius as the primary method for controlling entry speed, particularly for the fastest combination of entry and circulating path (typically the through movement).

4.4.4. Speed Thresholds

Achieving appropriate vehicular speeds through a roundabout is commonly considered the most critical design objective. Most documents suggest that design speeds should be between 15 and 30 mph, depending on the size and type of a roundabout. Table 26 shows the FHWA Guide design recommendations and notes the states where deviations exist. Because the Kansas and Arizona guides were prepared concurrently by the same authors, the recommendations from those documents have been combined here for clarity.

Table 26. Recommended Maximum Entry Design Speeds

Roundabout Category*	Recommended Maximum Entry Design Speed (mph)	
	FHWA	Kansas/Arizona
Mini-Roundabout	15	20
Urban Compact	15	20
Urban Single Lane	20	25
Urban Double Lane	25	25
Rural Single Lane	25	25
Rural Multilane	30	30

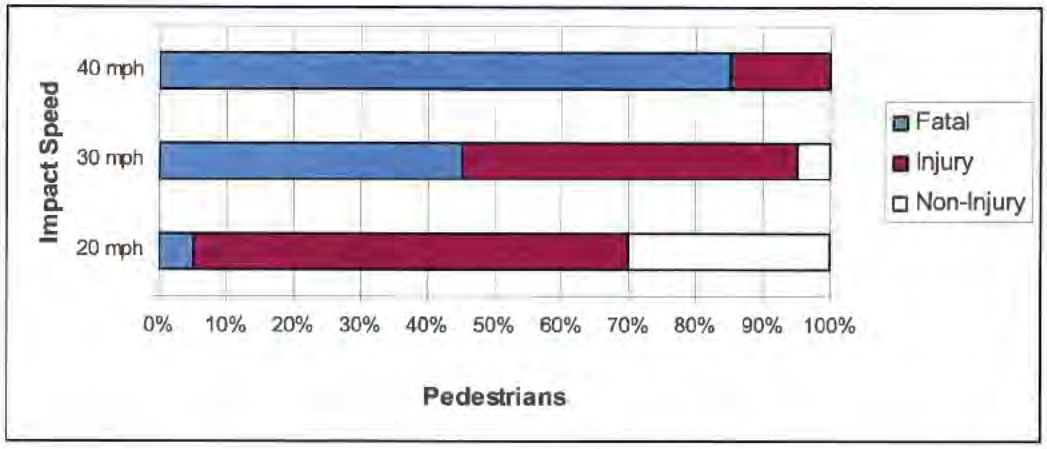
*Note: Roundabouts are categorized based on the size of the ICD, the number of circulating lanes, and urban/rural environment. Refer to the FHWA Roundabout Guide for further details.

Kansas and Arizona have slightly modified the entry design speeds. Both states recommend a 5-mph higher entry speed for mini-roundabouts, urban compact roundabouts, and urban single lane roundabouts (*2*, *8*).

Two factors particularly contribute to the selection of a maximum design speed for a roundabout:

- Pedestrian and bicycle safety (particularly in urban areas); and
- Severity of vehicle-vehicle collisions.

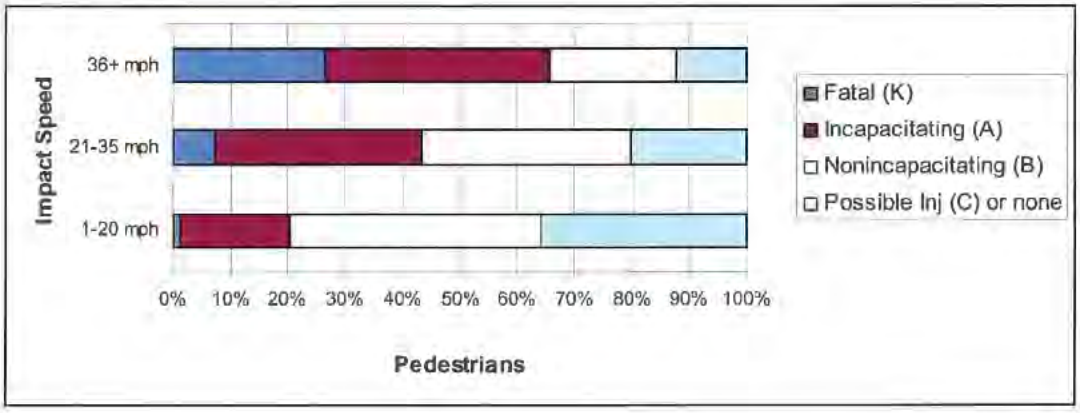
Although not specific to roundabouts, research conducted in the U.S. and UK has demonstrated a clear relationship between vehicle speed and pedestrian injury severity. UK experience, as cited by Leaf and Preusser *(49)*, suggests the relationships shown in Figure 13.



Source: (*49*)

Figure 13. Pedestrian Injury Severity Versus Impact Speed: United Kingdom Experience

The same study reviewed crash experience in Florida involving pedestrians in single-vehicle collisions. The results shown in Figure 14 suggest a similar pattern as the UK experience, although the severity of collisions at higher speeds does not appear to be quite as high as the UK experience. A direct comparison is not possible due to the limits of ranges for which data were reported in the cited study. Nonetheless, there is clear evidence that pedestrian safety deteriorates rapidly as vehicle speed increases.



Source: (*49*)

Figure 14. Pedestrian Injury Severity Versus Impact Speed: Florida Experience (1993-1996)

For this research effort, the authors examined the speed, geometric, and crash data collected for NCHRP 3-65 to determine whether any trends could be established between design speed and crash experience. The analysis examined crash and geometric data from 112 individual approaches. Two groupings of crashes were examined that are expected to have some relationship to entry speed: entering-circulating crashes (as determined by the NCHRP 3-65 researchers from a review of individual accident reports), and "all" crashes (entering-circulating crashes, plus entering rear-end, approach rear-end, and loss of control crashes).

Table 27 presents the distribution of crash rates (measured as crashes per million entering vehicles) by entry speed, which accounts for deceleration into the roundabout (V_I, adjusted) using the methodology described previously. Crashes have been grouped into a series of speed bins, and each bin shows five percentiles—5th, 25th, 50th, 75th, and 95th—to give a sense for the distribution of crashes within each speed bin. Figure 15 presents the same information graphically, grouping the data into two larger bins: 0-25 mph and 25-40 mph. Although the sample size is relatively small, the graphs generally suggest that the median crash rate increases with speed. However, the variation from site to site within a speed bin is considerable, with some sites with higher speeds having better safety performance than some sites with lower speeds. Indeed, the graphs suggest that although design speed appears to be a factor affecting the mean safety performance, factors other than design speed may contribute significantly to the safety performance of an individual roundabout.

Table 27. Distribution of Entry-Circulating Crash Rates by Adjusted Entry Speed

Speed Bin	0-20 mph	20-25 mph	25-30 mph	30-40 mph
Number of Observations	19	48	32	13
Mean Crash Rate (entry-circulating crashes per million entering vehicles)	0.31	0.55	0.88	0.55
Standard Deviation of Crash Rate	0.59	0.92	1.06	0.80
5th-percentile	0.00	0.00	0.00	0.00
25th-percentile	0.00	0.00	0.09	0.14
50th-percentile	0.00	0.15	0.49	0.41
75th-percentile	0.31	0.71	1.22	0.51
95th-percentile	1.56	2.23	3.19	1.74

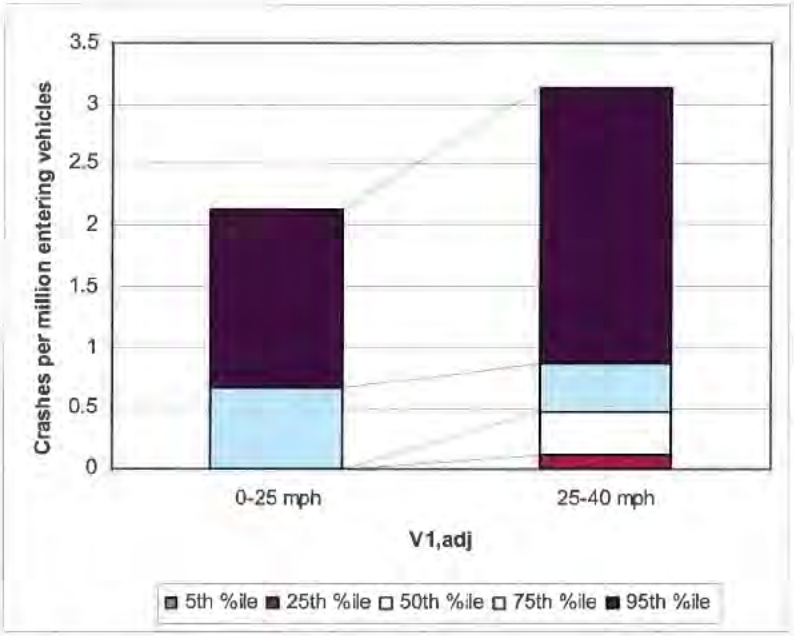


Figure 15. Vehicle Crash Rate Versus Adjusted Entry Speeds Accounting for Deceleration

More revealing information can be revealed when comparing the crash rate with the speed differential, as measured by the difference between predicted entry speed, V_1, and predicted left-turn circulating speed around the central island, V_4. As before, both unadjusted and adjusted entry speeds were used. Table 28 and Figure 16 show a speed differential of more than 20 mph between an unadjusted entry speed and the circulating speed appears to correspond to an increase in entry-circulating crashes. In particular, the figure shows that fewer than 50 percent of the sites with unadjusted speed differentials less than 20 mph show any entry-circulating crashes, whereas more than 75 percent of the sites with speed differentials greater than 20 mph show some crashes. This suggests that the recommendations in the current FHWA Guide of maximum speed differentials of 12 mph appears more conservative than necessary when using unadjusted entry

speeds, and there does not appear to be justification for a more stringent speed differential requirement of 6 mph.

Table 28. Distribution of Entry-Circulating Crash Rates by Differential between Unadjusted Entry Speed and Circulating Speed

Speed Bin	0-20 mph	20-35 mph
Number of Observations	97	15
Mean Crash Rate (entry-circulating crashes per million entering vehicles)	0.15	0.53
Standard Deviation of Crash Rate	0.35	0.64
5th-percentile	0.00	0.00
25th-percentile	0.00	0.07
50th-percentile	0.00	0.40
75th-percentile	0.15	0.58
95th-percentile	0.99	1.97

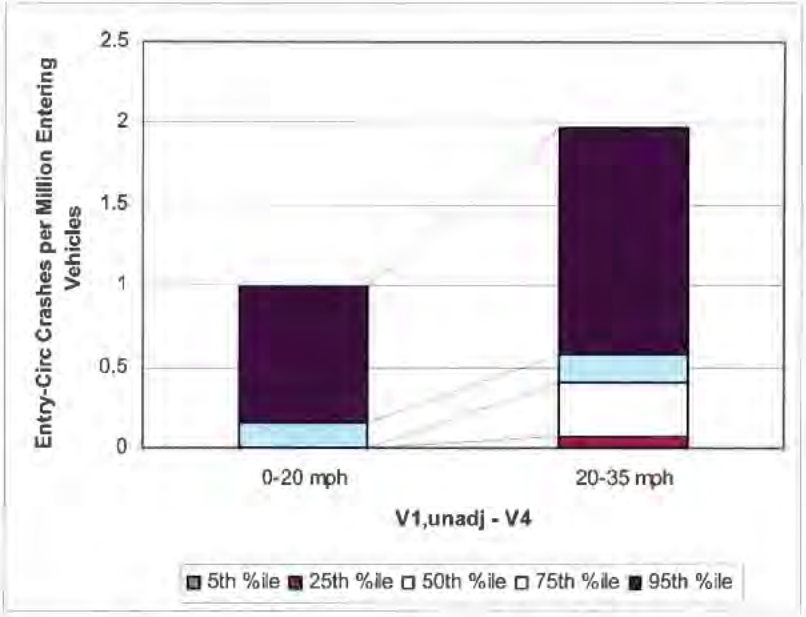


Figure 16. Entry-Circulating Vehicle Crash Rate Versus Differential in Speed between Unadjusted Entry Speeds and Conflicting Circulating Speeds

The trend becomes even clearer when the speed differential between adjusted entry speeds (entry speeds adjusted for deceleration) and circulating speeds is examined. The data in Table 29 and the graph in Figure 17 shows that a speed differential of more than 10 mph between an adjusted entry speed and the circulating speed appears to correspond to an increase in entry-circulating crashes. At least 75 percent of the sites with adjusted speed differentials of 10 mph or less had no reported entry-circulating crashes, whereas at least 50 percent of the sites with adjusted speed differentials of more than 10 mph had at least one entry-circulating crash. Therefore, the FHWA

Guide's recommendation for a maximum speed differential of 12 mph appears to be reasonable if the entry speeds are adjusted for deceleration effects. There appears to be no justification for a more stringent use of a 6 mph speed differential.

Table 29. Distribution of Entry-Circulating Crash Rates by Differential between Adjusted Entry Speed and Circulating Speed

Speed Bin	0-10 mph	10-20 mph
Number of Observations	65	47
Mean Crash Rate (entry-circulating crashes per million entering vehicles)	0.11	0.34
Standard Deviation of Crash Rate	0.30	0.51
5th-percentile	0.00	0.00
25th-percentile	0.00	0.00
50th-percentile	0.00	0.14
75th-percentile	0.00	0.43
95th-percentile	0.65	1.57

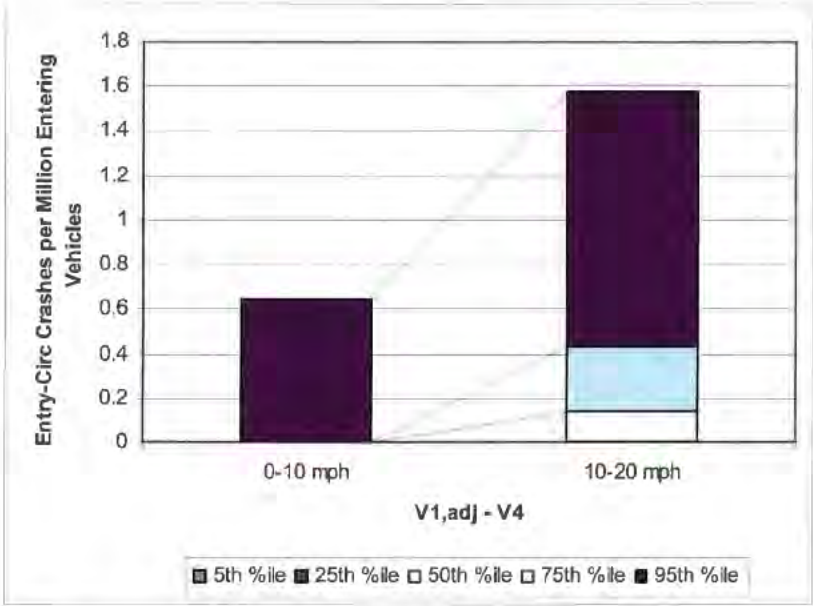


Figure 17. Entry-Circulating Vehicle Crash Rate Versus Differential in Speed between Entry Speeds Adjusted for Deceleration and Conflicting Circulating Speeds

The conclusions from this work are as follows:

- While speed prediction for the various movements through a roundabout is reasonably accurate, the data show a trend between increased speeds and increased crash experience. However, this trend is not necessarily statistically conclusive. Many sites in the NCHRP 3-65 database experienced very few crashes, if any, and the variation between the sites with nonzero crash rates can be significant.

- The NCHRP 3-65 data generally support the use of a threshold of 25 mph for an entry speed adjusted for the effects of deceleration. However, the resulting crash experience can vary significantly among sites.

- Speed differentials of more than 20 mph between unadjusted entry speeds (based solely on entry path radius) and left-turn circulating speeds, or 10 mph between adjusted entry speeds (accounting for deceleration) and left-turn circulating speeds, appear to correspond to an increase in entry-circulating crashes. Therefore, the FHWA Guide's recommendation for a maximum speed differential of 12 mph appears to be supported if the entry speeds are adjusted for deceleration effects.

4.5. Design Vehicle

Design vehicle accommodation often plays a major role in roundabout design. The roundabout geometry should generally accommodate the swept path of the vehicle tires and body. Because designing for large semi-trailers generally has adverse effects on the ability to manage speeds (e.g., wider lanes and larger radii for trucks results in faster speeds for passenger cars), truck aprons are often used around the perimeter of the central island. Truck aprons are typically elevated above the surface of the circulatory roadway to discourage passenger car use, while providing a mountable surface for semi-trailers to traverse.

Figure 18 displays a sample swept path for a typical semi-trailer making a left turn and a right turn.

Figure 18. Design Vehicle Swept Path

4.5.1. Selection of Design Vehicle

According to the FHWA Guide, the choice of a design vehicle will vary depending upon the approaching roadway types and the surrounding land use characteristics. Local and state agencies who maintain the roadway should be consulted to identify an appropriate design vehicle at each site. Commonly, WB-50 vehicles are the largest vehicles along collectors and arterials. Larger trucks, such as WB-67, may need to be addressed at intersections on interstate freeways or state highway systems. Smaller design vehicles may often be chosen for local street intersections.

In California, trucks with single 48-foot semi-trailers represent the most common large vehicle; these are represented by the STAA Design Vehicle (for routes on the National Network and Terminal Access Routes) or the California Legal Design Vehicle (for all other facilities in California), as described in the California *Highway Design Manual* Section 404.2 *(4)*. Smaller design vehicles such as emergency vehicles may often be chosen for local street intersections, although large moving trucks may use such intersections on occasion.

States have adopted different policies to determine design vehicles to use. For example, according to the Washington State Department of Transportation (*46*), it is desirable to design the circulating roadway so that a BUS design vehicle in urban areas and a WB-40 in rural areas can use the roundabout without encroaching on the truck apron. Roundabouts on Washington's state routes need to be designed to handle a WB-67 design vehicle using truck aprons as appropriate.

The Kansas Department of Transportation (*2*) also identifies typical design vehicles for various roadway types. For freeway ramp terminals and other intersections on the state highway routes, the design vehicle is normally a WB-67. At urban collector or arterial intersections, the design vehicle is often a WB-50 semi-trailer. For urban intersections, a bus or single-unit truck is commonly used.

Recent research by Harwood et al. *(50)* has suggested that the WB-50 design vehicle is no longer common in the U.S. truck fleet and that the WB-62 design vehicle is more common.

It is generally common practice to have passenger vehicles completely contained within the circulatory roadway of the roundabout and to only allow truck trailers to track onto a truck apron.

4.5.2. Multilane Design Vehicle Considerations

At multilane roundabouts, the choice of design vehicle is more complex than for single-lane cases. In most cases, it is not feasible and not necessary to accommodate two semi-trailer vehicles side-by-side through the roundabout. Semi-trailers are usually allowed to track over lane markings within the roundabout entries, circulatory roadway, and exits. However, there is a certain combination of side-by-side vehicles that should be accommodated at each given roundabout design.

Table 30 summarizes guidance available through national and state agencies on the subject of accommodating side-by-side vehicle circulation in roundabouts. Information from Australia is also included in the table. Most agencies include in their guidance the caveat that site-specific conditions should be taken into account to appropriately identify the design vehicle (or pair of design vehicles).

Table 30. Guidance on Multilane Circulatory Roadway Width

Agency	Source	Inscribed Circle Diameter	Circulatory Roadway Width for WB-67 Design Vehicle	Recommended Pair of Side-by-Side Vehicles for Design
FHWA	*Roundabouts: An Informational Guide (1)*	180 feet	30 feet (minimum)	• Depending on site conditions: • Two passenger cars OR • Passenger car + single-unit truck OR • Semi-trailer + passenger car OR • Semi-trailer + single-unit truck
Kansas DOT	*Kansas Roundabout Guide (2)*	180 feet	30 feet (minimum)	• Depending on site conditions: • Passenger car + bus OR • Passenger car + single-unit truck OR • Semi-trailer + passenger car
Washington State DOT	*WSDOT Design Manual (46)*	N/A	• Maintain 2-ft clearance to any curb face • Minimum circulatory with equal to or slightly wider (120%) than maximum entry width.	N/A
New York State DOT	*Roundabouts: Interim Requirements and Guidance (45)*	N/A	Maintain 3-ft horizontal clearance	N/A
Missouri DOT	*Project Development Manual*	N/A	N/A	Two trucks (type and size not specified)
Wisconsin DOT	*Facilities Development Manual (9)*	N/A	N/A	N/A
Pennsylvania DOT	*Guide to Roundabouts (44)*	N/A	N/A	N/A
Florida DOT	*Florida Roundabout Guide (43)*	N/A	Will not normally exceed 1.2 times the maximum entry width	N/A
Oregon DOT	*Modern Roundabouts for Oregon (41)*	N/A	Will not normally exceed 1.2 times the maximum entry width	N/A
Austroads	*Design Guide For Roundabouts (14)*	180 feet	32 feet	• 1 articulated vehicle + 1 car

4.5.3. Potential Intersection Applications

Table 31 provides a list of potential design vehicle guidelines based on the functional class of intersecting roadways.

Table 31. Potential Design Vehicles by Roadway Type

Approach Roadway Type	Typical Single-Vehicle Accommodation	Typical Side-by-Side Accommodation
Single-Lane Non-State Highway	WB-50	--
Single-Lane State Highway off National Network	STAA or California Maximum	--
Single-Lane State Highway on National Network	STAA	--
Multilane Non-State Highway	WB-50 or STAA/California	Bus and Passenger Car
Multilane State Highway off National Network	STAA or California Maximum	Bus/Motorhome and Passenger Car
Multilane State Highway on National Network	STAA	Bus/Motorhome and Passenger Car

The potential guidelines in Table 31 are typical applications and will not apply in all cases. It may be appropriate, for example, to design a roundabout located off the state highway system to accommodate an STAA vehicle if the area is in an industrial district. In addition, the combination of side-by-side vehicles at multilane roundabouts may vary depending on site-specific considerations. For instance, if the percentage of truck traffic is considerable and a given roundabout approach is expected to operate at or near its capacity limit, it may be desirable to accommodate the design vehicle and a passenger car simultaneously through the roundabout. However, it should be understood that such a design will likely require such wide lanes and/or large turning radii that speed control and overall safety may be compromised.

Accommodating an STAA vehicle and passenger car side-by-side is frequently infeasible at double-lane roundabouts, because the STAA vehicle would require lane widths of approximately 20 feet. At a three-lane roundabout, it could be possible to accommodate an STAA vehicle and one passenger car simultaneously due to the generally wider circulatory roadway.

Figure 19, Figure 20, and Figure 21 display example swept paths of design vehicles at single-lane non-state highway, single-lane state highway, and multilane roundabouts, respectively.

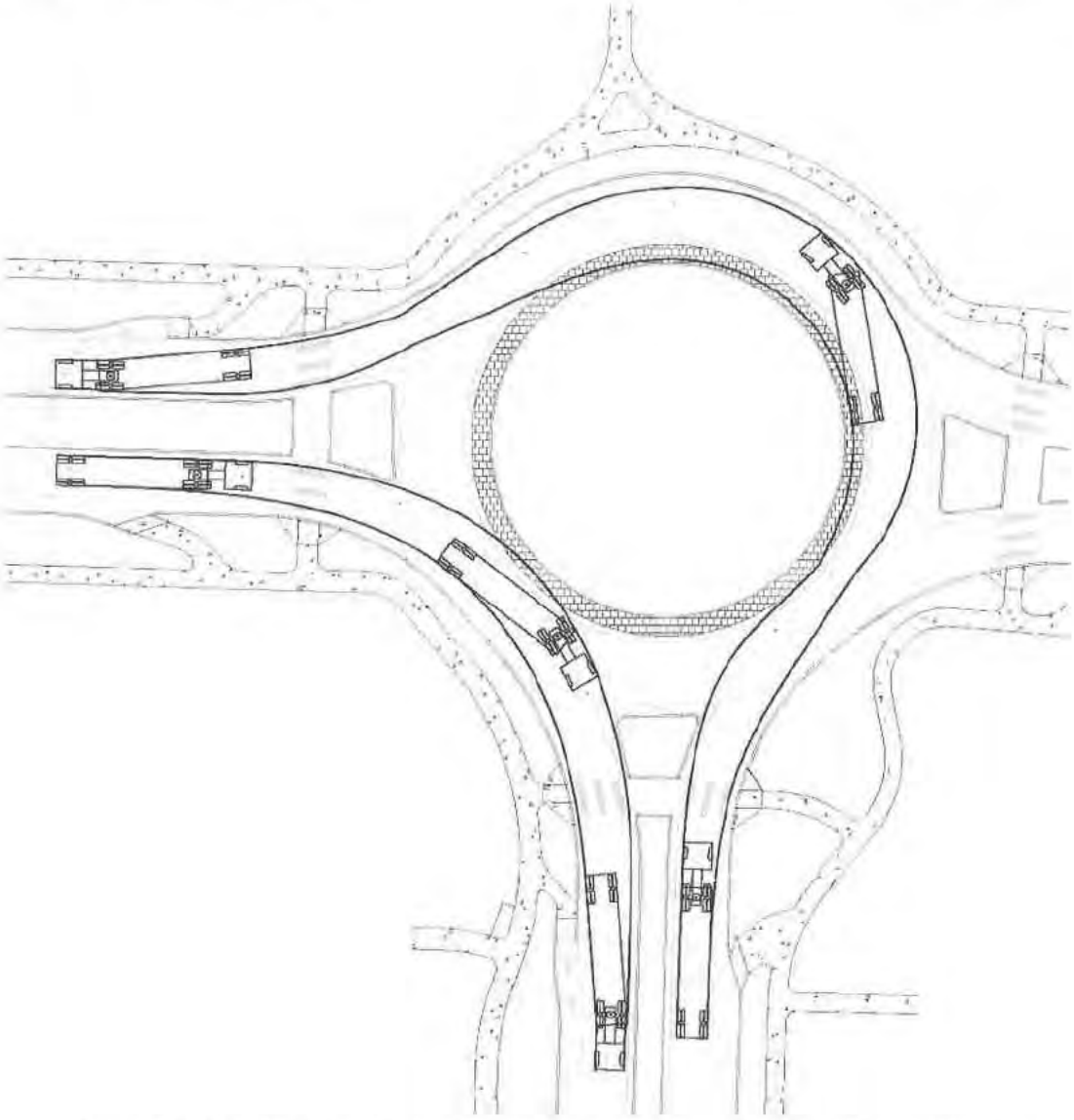


Figure 19. WB-50 Swept Paths, Single-Lane Non-State Highway Roundabout

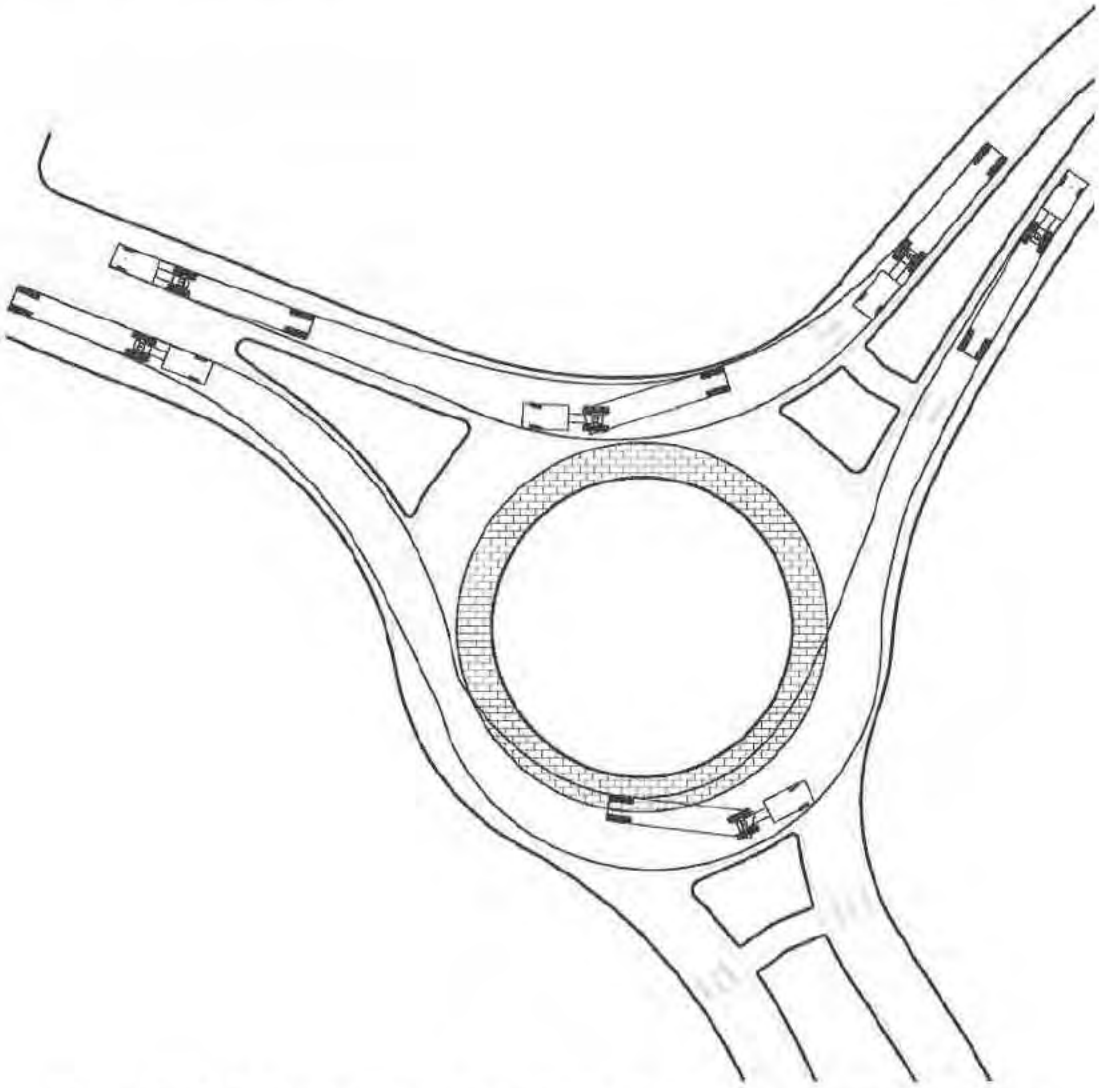


Figure 20. STAA Vehicle Swept Paths, Single-Lane State Highway Roundabout

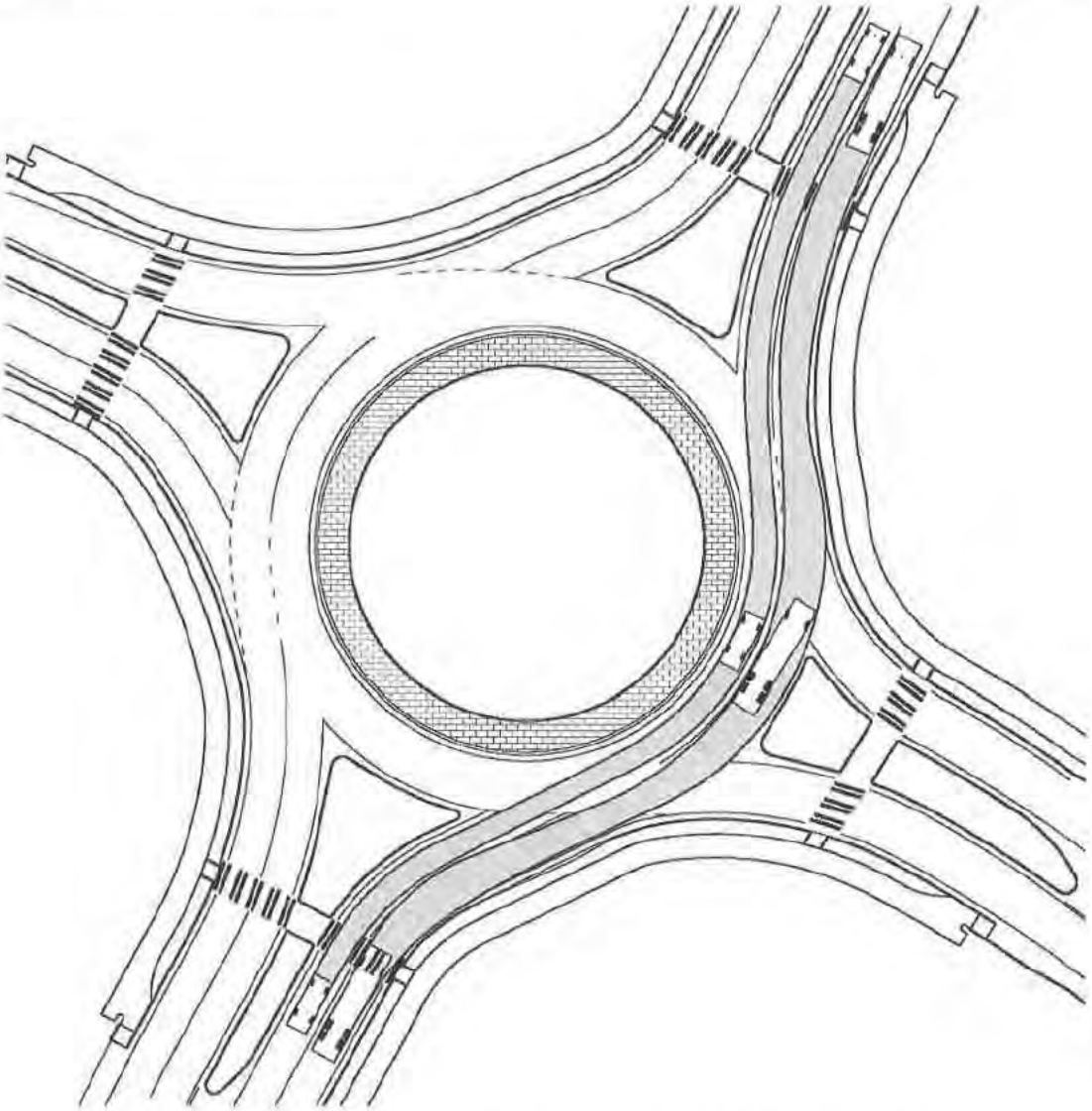


Figure 21. Bus and Passenger Car Swept Paths, Multilane Roundabout

4.6. Spacing of Entries and Exits

The spacing of entries and exits is particularly important at roundabouts with more than four legs, roundabouts with skewed legs, and multilane roundabouts. This section discusses two key components: entry-exit separation and consecutive entries.

4.6.1. Entry-Exit Separation

At multilane roundabouts, problems can occur when there is too much separation between the entry and exit of adjacent legs. The problem occurs when vehicular paths from the entry merge with the vehicular paths in the circulatory roadway and then diverge at the next exit. Under this type of design, an entering vehicle in the outside lane may be tempted to enter next to a circulating vehicle in the inside lane. Depending on the turning movement pattern of each

vehicle (e.g., both vehicles are intending to make through movements), this may cause an exit-circulating conflict. Figure 22 displays an example of a roundabout design with this problem. Note that this example has the same lane configuration as the roundabout presented previously in Figure 11; however, the intersection skew creates a section of circulatory roadway between an entry and subsequent exit for which the striping creates an exit-circulating path conflict.

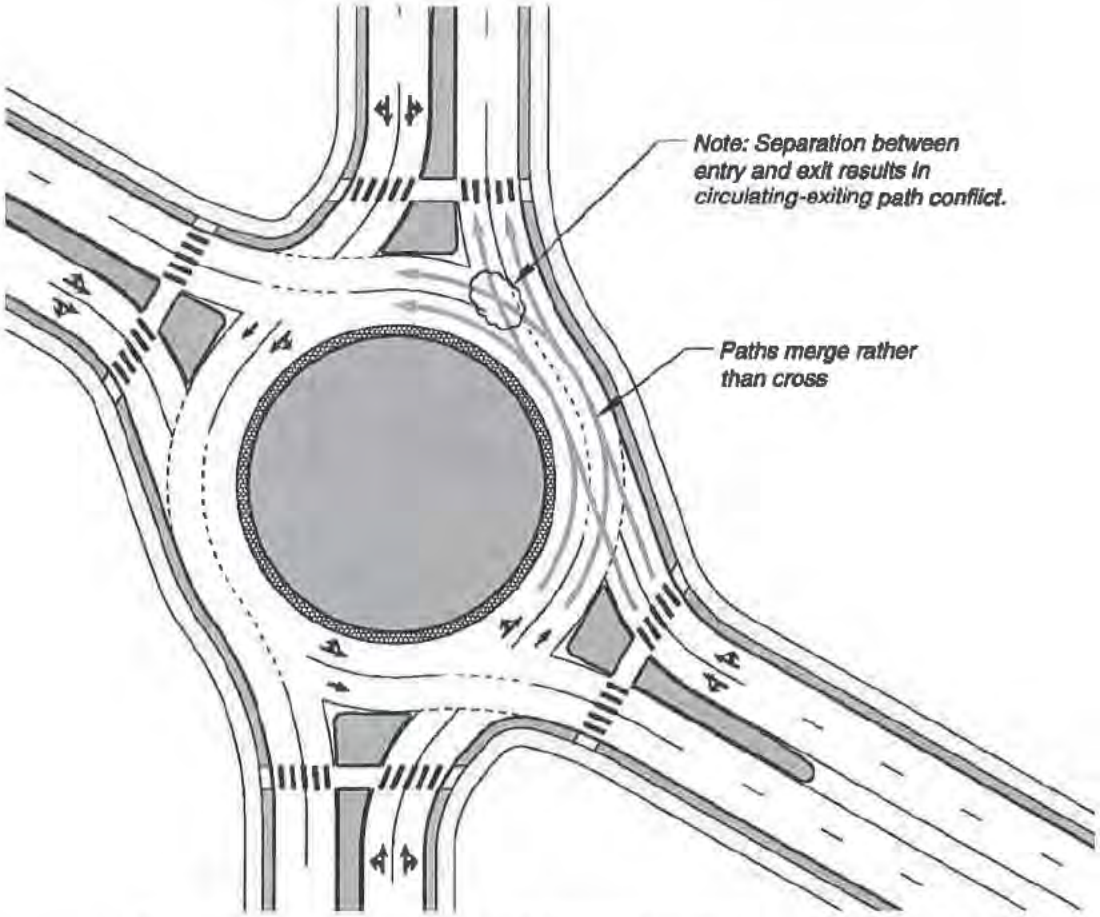


Figure 22. Example Design with Circulating-Exiting Path Conflict

In this example, the design consists of double-lane entries and double-lane exits at all approaches. The separation between legs causes the entry and circulatory paths to merge, creating conflicts at the downstream exit.

At least two general solutions to the problem exist. One solution, shown in Figure 23, maintains the basic approach alignments but modifies the lane assignments. In this case, the right lane of the westbound approach is converted to a right-turn only lane. An alternative solution (not shown) could be converting the left lane of the northbound approach to a left-turn only lane. In either of these cases, the new lane configurations would need to be evaluated under the projected traffic volumes to determine whether they would provide adequate capacity.

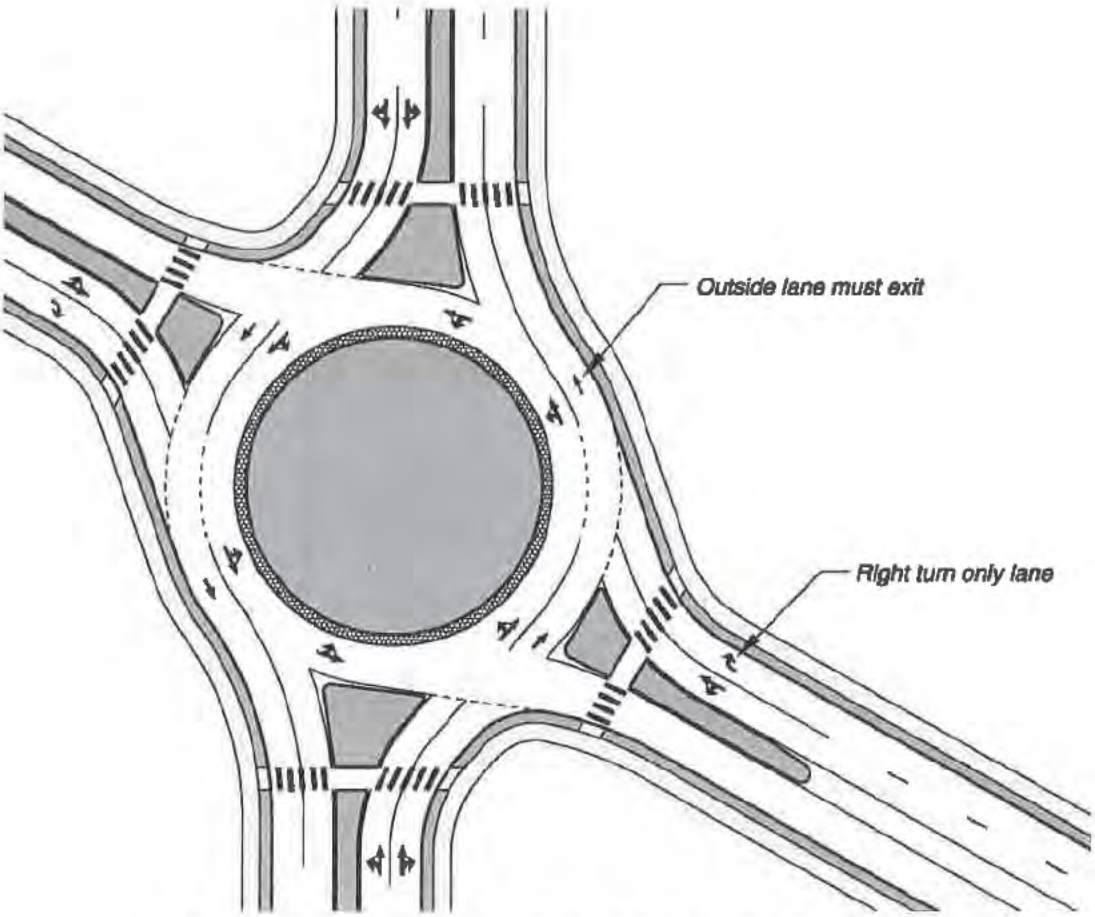


Figure 23. Solution Option #1: Modify Lane Configuration

A second general solution option, shown in Figure 24, would be realigning one or more approaches to reduce the separation between legs. As shown in the figure, realigning the eastbound approach creates a more perpendicular intersection angle and results in entry-circulating paths that cross, rather than merge.

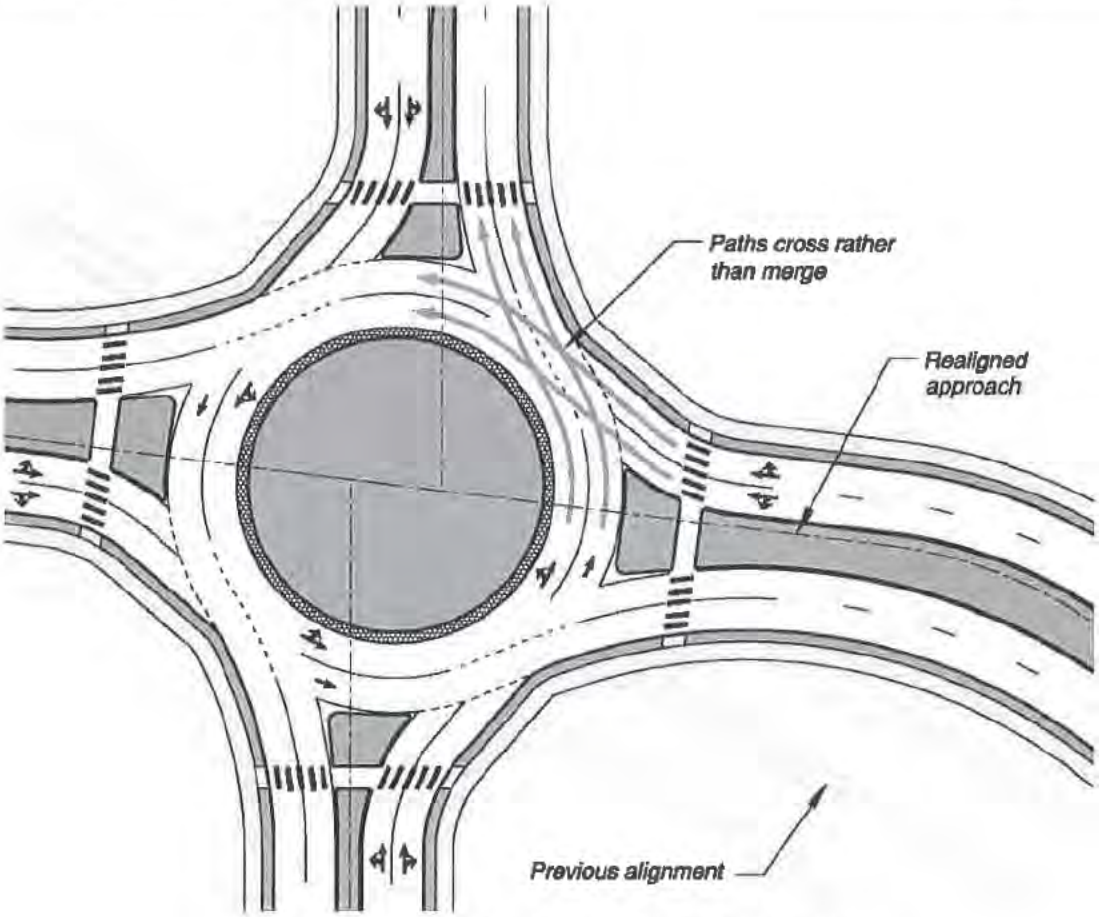


Figure 24. Solution Option #2: Realign Approaches

4.6.2. Design of Consecutive Entries

For most roundabouts, an exit is located between a subject entry and the immediate upstream entry. However, at roundabouts involving one-way roadways, it is possible for two entries to be located immediately adjacent to one another. This is particularly common at interchange ramp terminals. The close spacing of these entries can present a unique challenge to the design.

The primary issue that can occur is that the angle between the consecutive entries becomes overly acute, which can cause problems because drivers may not be able to physically turn their heads back far enough and left to view oncoming traffic from the immediate upstream entry.

In general, the intersection angle between consecutive roundabout entries, and indeed the angle of visibility to the left for all entries, should conform to the same design guidelines as for conventional intersections. AASHTO recommends avoiding intersection angles of less than 60 degrees *(48)*. The Caltrans *Highway Design Manual* recommends intersection angles of no less than 75 degrees for at-grade intersections *(4)*, and FHWA's *Highway Design Handbook for*

Older Drivers and Pedestrians also recommends using 75 degree as the minimum intersection angle *(51)*.

At roundabouts, the intersection angle may be measured as the angle between a vehicle's alignment at the yield line and the sight line required according to intersection sight-distance guidelines.

Figure 25 displays an example of a roundabout design at an interchange in which the angle between entries is more severe than desirable.

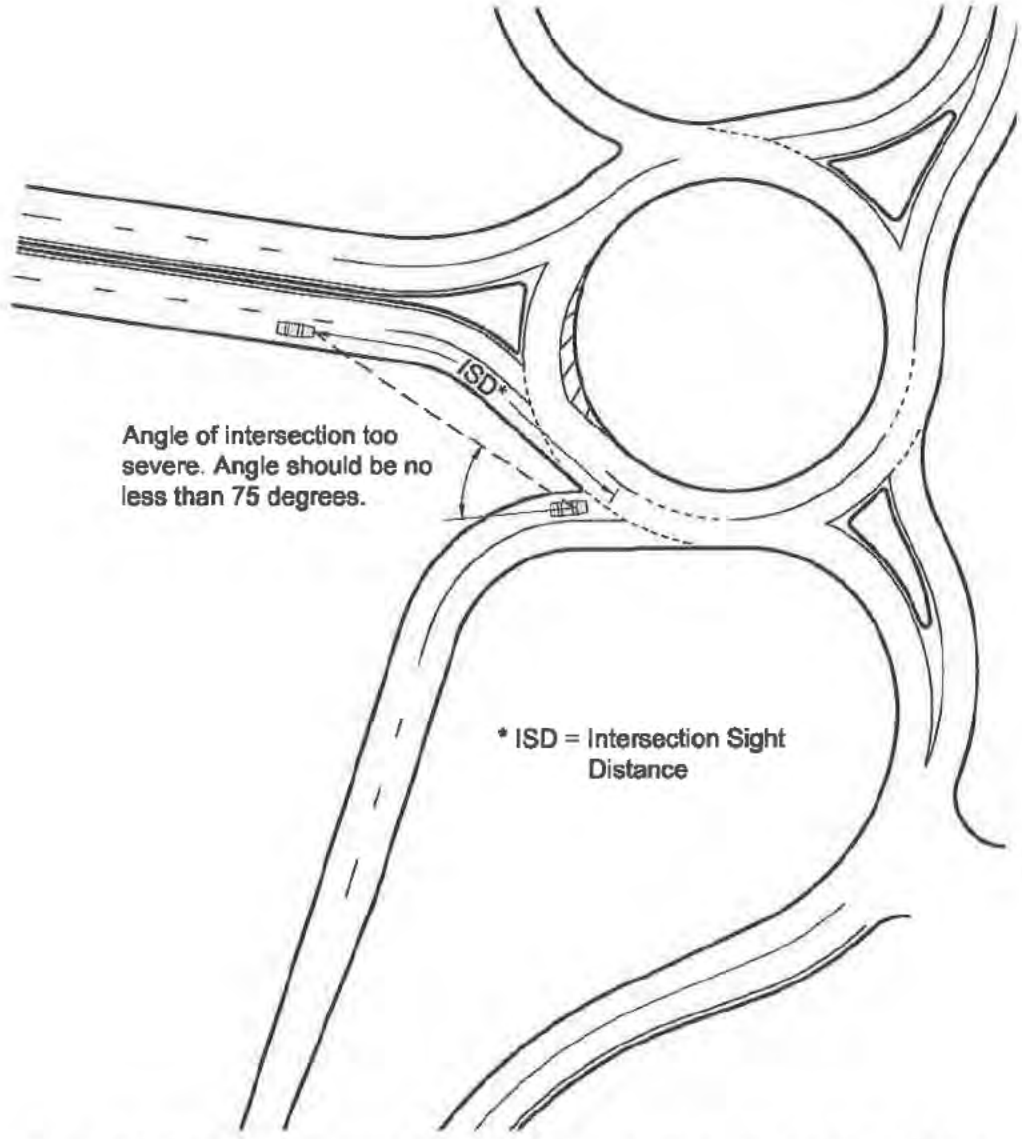


Figure 25. Example Design with Angle of Visibility to Left That Is Too Severe

In the design in Figure 25, the angle between the driver and the position of oncoming traffic is less than the recommended 75 degrees. A possible solution, in this case, would be realigning the off-ramp approach, as shown in Figure 26, to improve the intersection angle.

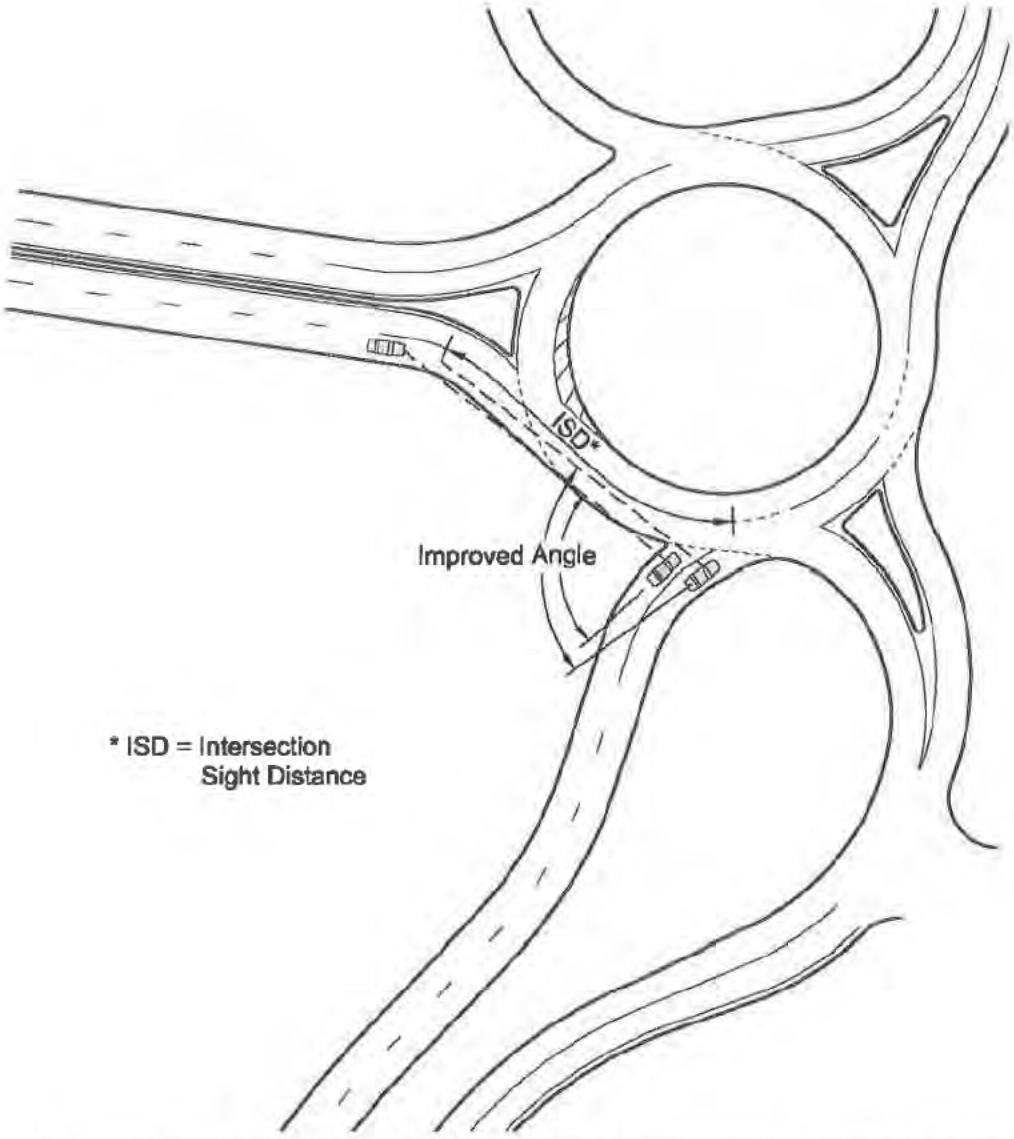


Figure 26. Roundabout with Realigned Ramp Terminal Approach to Provide Better Angle of Visibility to Left

4.7. Inscribed Circle Diameter

The inscribed circle diameter (ICD) is one of the major dimensions in roundabout design. It represents the overall size of a roundabout and is usually determined by a number of design parameters such as design speed, design vehicle, number of lanes, and natural path alignment. An iterative process is usually required to determine the optimal ICD size.

The ICD is the most common dimension used to describe the overall size of a roundabout. Table 32 summarizes the FHWA Guide recommendations and notes where states have deviated. As can be seen in the table, some states identify broader ICD ranges than those provided in the FHWA Roundabout Guide. Although slightly deviated from the FHWA guide, both the Kansas and Arizona guides have similar recommendations due to similar authorship. In practice, it is not uncommon that the actual value may fall outside these typical ranges.

Table 32. Typical Inscribed Circle Diameter Ranges

Roundabout Category*	Inscribed Circle Diameter Range (ft)		
	FHWA	Kansas/Arizona	Wisconsin
Mini-Roundabout	45-80	50-90	N/A
Urban Compact	80-100	90-120	N/A
Urban Single Lane	100-130	120-150	100-160
Urban Double Lane	150-180	150-220	150-200
Urban Multilane (3 or 4-lane entry)	N/A	N/A	180-330
Rural Single Lane	115-130	130-200	115-180
Rural Double Lane	180-200	175-250	180-230
Rural Multilane (3 lane entry)	N/A	N/A	180-330

*Note: Roundabouts are categorized based on the size of the ICD, the number of circulating lanes, and urban/rural environment. Refer to the FHWA Guide for further details.

Although ICD is an important dimension when laying out a roundabout, it is a byproduct of multiple factors rather than a critical input chosen on its own. These factors include the following:

- *Lane numbers and arrangements.* The number of lanes that a roundabout needs to serve has the largest influence on the ICD. Two-lane roundabouts generally have larger ICDs than single-lane roundabouts to accommodate a greater number of lanes. Likewise, roundabouts with more than two lanes are generally larger than two-lane roundabouts. Note that overly large ICDs with multilane roundabouts can create entry-exit separation problems.

- *Design vehicle.* The design vehicle that a roundabout must accommodate can have a direct influence on the ICD. This is particularly true of single-lane roundabouts, where the design vehicle has the most direct influence on ICD. It can also have some influence on multilane roundabouts, depending on how trucks are expected to circulate within the roundabout. See the previous section on design vehicle for a more detailed discussion.

- *Number of legs.* Roundabouts with more than four legs are typically larger than roundabouts with four legs, given the same number of lanes. This is necessary, in part, to facilitate turning movements between consecutive legs.

- *Approach alignment.* The alignment of individual approaches affects the appropriate ICD for the roundabout. Angles less than 90 degrees between consecutive legs sometimes require a larger ICD to facilitate turning movements between those legs. In addition, a larger ICD may be used as a method to provide adequate speed control for right-turn movements between legs that are greater than 90 degrees apart.

Due to the interactive and sometimes conflicting nature of these elements, the ICD is often the result of an iterative process that attempts to balance competing objectives. As a result, there is no one correct ICD for a given roundabout, provided that the overall objectives for the roundabout are met. Table 33 provides common ICDs for a variety of situations, for illustration purposes; successful exceptions may be found in the field.

Table 33. Common Ranges of Inscribed Circle Diameters

Scenario	Common Range of Inscribed Circle Diameters*
Single-lane roundabout, 3 to 4 legs, 90-degree angles, WB-50 design vehicle	115**–130 ft
Single-lane roundabout, 3 to 4 legs, 90-degree angles, STAA/WB-67 design vehicle	130–150 ft
Single-lane roundabout, 5 to 6 legs, WB-50 design vehicle	130–180 ft
Single-lane roundabout, 5 to 6 legs, STAA/WB-67 design vehicle	150–200 ft
Double-lane roundabout, 3 to 4 legs	150–220 ft
Double-lane roundabout, 5 to 6 legs	180–240 ft
Triple-lane roundabout, 4 legs	180–330 ft

* Ranges are representative but not inclusive of all possible values
** Smaller diameters are possible but may require trucks to circulate at very low speeds
Source: Adapted from FHWA (*1*), Kansas (*2*), and Wisconsin (*9*) roundabout guidance, as well as the authors' experience and judgment.

While the preceding discussion assumes a single ICD representing the entire roundabout, this is only true if the roundabout is circular in shape. Non-circular roundabouts (e.g., elliptical roundabouts) are sometimes the best choice for an intersection to balance the competing objectives.

In some cases, the ICD may reflect an anticipated ultimate configuration rather than a near-term, interim configuration. For example, it may be appropriate to design a single-lane roundabout with 4 legs and an STAA design vehicle with an ICD of 180 ft if it has been designed for potential future conversion to a double-lane roundabout, even though the "typical" ICD for a single-lane roundabout is much smaller.

4.8. Roundabouts in High-Speed Environments

Roundabouts have demonstrated success in high-speed environments. Recent NCHRP 3-65 research has found that roundabouts located in rural environments (commonly associated with speeds of 55 to 65 miles per hour) has improved crash experience compared to previous control (typically two-way stop control): 72 percent reduction in all crashes (standard error of 4 percent) and 87 percent reduction (standard error of 3 percent) (*7*, Table 28).

The authors believe that the following features of the roundabout are likely to have contributed to the reported safety record:

- The shape of a roundabout physically prevents the type of high-speed angle and head-on collisions that cause fatalities and severe injuries at conventional intersections.

- The predictably slow speed of all traffic through a roundabout provides consistency in speed through the intersection. Speeds at signalized intersections vary widely from full running speed to completely stopped conditions, and two-way stop-controlled intersections have significant speed differentials between through traffic and turning traffic. These speed differentials are often the source of rear-end crashes and angle-collisions due to misjudged gaps.

- The low-speed design of the roundabout reduces the likely severity of any type of collision, should it occur.

A high speed environment requires adequate time (distance) for drivers to interpret the impending intersection configuration and to appropriately react (slow down) to the changing operational needs. A longer distance between the roadway typical section and the roundabout entry (combined with cross-sectional features that reinforce the change from the upstream typical section), creates more opportunities for drivers to reduce speed, compared with the traditional roundabout approach configuration. The design of a roundabout in a high-speed rural environment typically employs all of the techniques of roundabouts in a lower speed environment, with greater emphasis on the following items:

- The visibility of the roundabout from a distance. These include the use of a prominent central island, prominent splitter islands, and appropriate illumination and signing.

- Alignment and cross sectional cues to present the intersection geometry to the driver. These include the use of flatter and longer painted tapers in advance of the splitter islands, longer splitter islands, and curbing on approaches. Figure 27 shows a typical roundabout with minimal approach treatments; Figure 28 shows the same roundabout with an extended approach treatment. One possible way to determine appropriate splitter island lengths is to use principles of freeway exit ramp design, which considers the transition from free flow speeds to the speed of the controlling ramp curve. In addition, some agencies have employed reverse curvature on the approach to transition driver speeds, as shown in Figure 29; the use of this technique is under debate.

- Use of signs and pavement markings to supplement the geometric features. These often include larger-sized signs than are typically used in urban areas. In addition, some agencies around the U.S. have supplemental signs and pavement markings with continuously flashing beacons, rumble strips, and/or speed-activated warning signs.

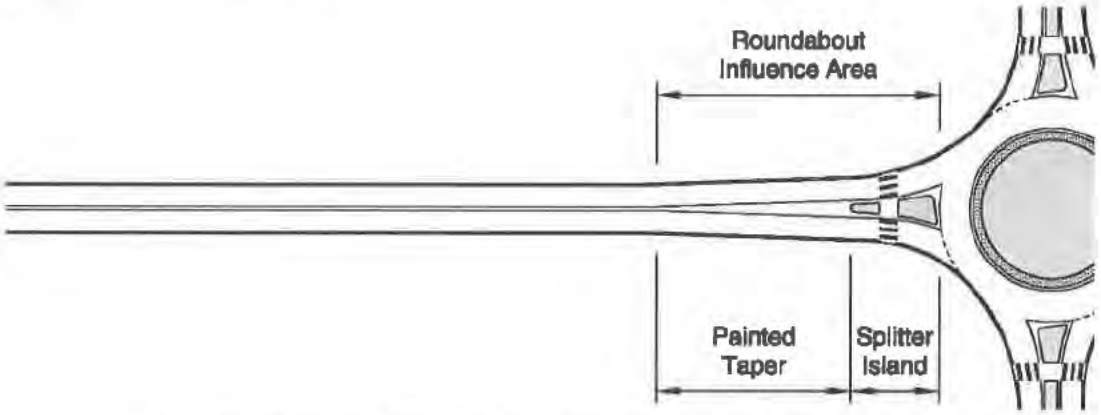


Figure 27. Approach Treatment with Minimal Splitter Island Length

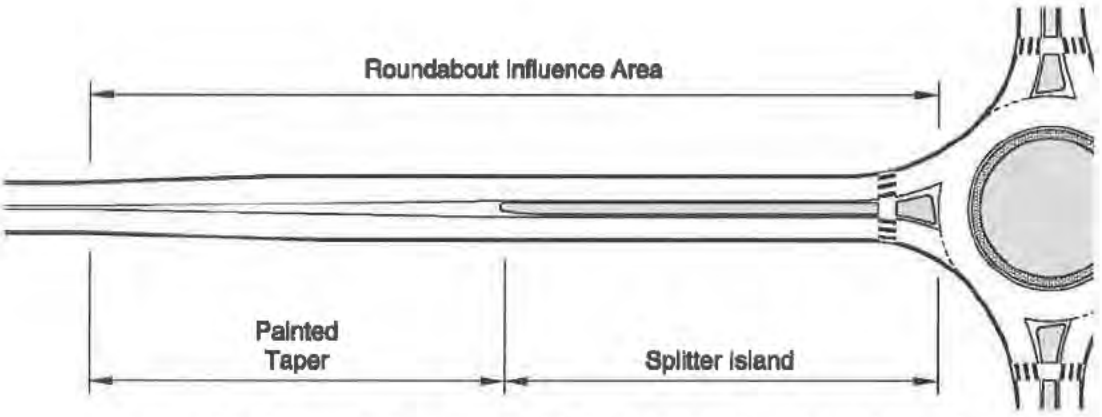


Figure 28. Approach Treatment with Extended Splitter Island Length

Source: W&H Pacific, Inc.

Figure 29. Annotated Photograph of Roundabout in Kittitas County, Washington, Showing Painted Taper and Splitter Island Incorporating Geometric Reverse Curves to Transition Driver Speeds.

4.9. Intersection Sight Distance

The critical headway data discussed previously can be used to provide California-specific calibration of the intersection sight-distance methodology given in the FHWA Guide. Based on the findings from the operational research on California roundabout presented in Chapter 2 of this report, the authors recommend that for California conditions, the value of 6.5 seconds given in Equation 6-3 of the FHWA Guide should be replaced with a value of 5.9 seconds (equal to the mean plus one standard deviation of critical headway for single-lane roundabouts, or 4.8 + 1.1 seconds).

It should be noted that the overall procedure for estimating intersection sight distance at roundabouts should be considered interim until a more comprehensive analysis of intersection sight distance issues unique to roundabouts can be analyzed. One of the anticipated products from the NCHRP 3-65A work to update the FHWA Guide is to prepare a complete research problem statement to support funding of a comprehensive look at intersection sight distance at roundabouts.

4.10. Design Recommendations for Pedestrians

The evidence examined under this research effort (both literature review and field observation of California and other roundabouts) suggests that current design practices for pedestrians at roundabouts generally appear to be appropriate, although further research is needed to develop appropriate treatments to accommodate pedestrians with vision disabilities. The uncontrolled crosswalk treatments appear to operate well for the majority of users (pedestrians and conflicting vehicles). The use of a setback of one to two vehicles from the roundabout appears to be effective. Stopping sight distance needs to be provided so that motorists have the proper time to react after observing a pedestrian using the roundabout crosswalk; the same sight distance requirement helps pedestrian determine the appropriate time to enter the crosswalk. The pedestrian crossing treatments and methodology for selecting treatments as suggested in TCRP Report 112/NCHRP Report 562 should be considered.

For pedestrians with visual impairments, recent and ongoing research suggests that a simple, uncontrolled crosswalk may be insufficient to provide access at some roundabouts, particularly at multilane roundabouts. The Access Board has made the draft recommendation that all pedestrian crossings that span two or more entry or exit lanes be provided with some form of signalization. Research on this treatment and other less restrictive treatments is being conducted as part of NCHRP 3-78 and other studies. The authors recommend caution in establishing a California-wide policy until that research is complete.

4.11. Design Recommendations for Bicycles

Current design practices for accommodating bicyclists at roundabouts incorporate the use of treatments to provide cyclists of varying abilities with the option to circulate as motorists or as pedestrians. This includes the provision of a wider sidewalk or shared path around the perimeter of the roundabout and ramps to connect the sidewalk or path to the bicycle facilities on each leg as appropriate. The research conducted for this report suggests that such practice is appropriate in California.

On roundabouts with high volumes of bicyclists using the crosswalk as part of a shared path (i.e., they are not dismounted and walking their bicycles) that yield signs may be provided for bicyclists entering the crosswalk. The observational analysis in this study found that bicyclists used the crosswalk more at multilane roundabouts than at single-lane roundabouts where a bicyclist-pedestrian shared path exist around the roundabout. The yield sign will serve to remind the bicyclist that they do not have the right-of-way when riding across a crosswalk. Many motorists stopped for bicyclists that were riding in the crosswalk, but of the collisions looked at, 44% of the incidents involved a bicyclist/motorist conflict.

5. SUMMARY AND RECOMMENDATIONS

This report presents the results of a literature review, data collection and analysis, and an expert review of roundabout design practices to develop a set of recommendations for Caltrans to consider as it updates its roundabout design policies and standards. The authors suggest the following:

- Attention to the overall layout of a roundabout is often more critical than the dimensions of individual components. In effect, roundabout design is performance-based; that is, success is measured from its output (operational and safety performance, accommodation of design vehicle, pedestrian and bicycle usability, etc.) rather than its input (individual design dimensions).

- The following California-specific values for critical headway and follow-up headway may be considered to calibrate capacity models to determine appropriate lane numbers and arrangements:

  - Single-lane roundabouts: critical headway = 4.8 s, follow-up headway = 2.5 s.

  - Multilane roundabouts, left lane: critical headway = 4.7 s, follow-up headway = 2.2 s.

  - Multilane roundabouts, right lane: critical headway = 4.4 s, follow-up headway = 2.2 s.

- Using the above calibrated values, the following capacity models can be used in a manner consistent with the recommendations from NCHRP 572, with c equal to capacity (passenger car equivalents per hour) and v_c equal to the conflicting flow rate (passenger car equivalents per hour):

  - Single-lane: $c = 1440 \cdot \exp(-0.0010 \cdot v_c)$

  - Multilane right lane: $c = 1640 \cdot \exp(-0.0009 \cdot v_c)$

  - Multilane left lane: $c = 1640 \cdot \exp(-0.0010 \cdot v_c)$

- The current methodology presented in the FHWA Guide for estimating vehicular speeds throughout the roundabout should be modified to account for acceleration and deceleration effects.

- While speed prediction for the various movements through a roundabout is reasonably accurate, the data show a trend between increased speeds and increased crash experience. However, this trend is not necessarily

statistically conclusive. Many sites in the NCHRP 3-65 database experienced few to zero crashes, and the site-to-site variation for the sites with nonzero crash rates is often significant.

- The NCHRP 3-65 data generally support the use of a 25-mph threshold for an entry speed adjusted for the effects of deceleration. However, the resulting crash experience can vary significantly among sites.

- Speed differentials of more than 10 mph between adjusted entry speeds (accounting for deceleration) and left-turn circulating speeds appear to correspond to an increase in entry-circulating crashes. Therefore, the FHWA Guide's recommendation for a maximum speed differential of 12 mph appears to be supported if one adjusts entry speeds for deceleration effects.

- The report has suggested the appropriate design vehicles and side-by-side accommodation through single-lane and multilane roundabouts for various types of roadways.

- Care must be taken with the design of roundabouts to minimize exit-circulating conflicts through appropriate spacing of entries and following exits. Examples have been provided.

- Care must be taken with the design of roundabouts to ensure appropriate visibility angles to the left. This need occurs most commonly in roundabouts with consecutive entries, such as at freeway interchange terminals. Examples have been provided.

- Typical ranges of inscribed circle diameter have been provided; however, inscribed circle diameter is a product of other factors and not a critical input parameter by itself.

- For intersection sight distance calculations, a critical headway of 5.9 seconds is recommended instead of the 6.5 seconds presented in the FHWA Roundabout Guide. This methodology should be considered interim until a study on roundabout intersection sight distance is completed.

- The effect of roundabouts on pedestrian and bicyclist demand remains an open question. Data collected from sites anticipated to be converted to roundabouts will support a future research effort to address this question.

- Current U.S. design methods to accommodate pedestrians appear to be appropriate, although further research is needed to develop appropriate treatments to accommodate pedestrians with vision disabilities. The uncontrolled crosswalk treatments appear to operate well for the majority of users (pedestrians and conflicting vehicles). The use of a setback of one to two vehicles from the roundabout appears to be effective. Stopping sight

distance needs to be provided so that motorists have the proper time to react after observing a pedestrian using the roundabout crosswalk; the same sight distance requirement helps pedestrian determine the appropriate time to enter the crosswalk. The pedestrian crossing treatments and methodology for selecting treatments as suggested in TCRP Report 112/NCHRP Report 562 should be considered.

- For pedestrians with visual impairments, recent and ongoing research suggests that a simple, uncontrolled crosswalk may be insufficient to provide access at some roundabouts, particularly at multilane roundabouts. The Access Board has made the draft recommendation that all pedestrian crossings that span two or more entry or exit lanes be provided with some form of signalization. Research on this treatment and other less restrictive treatments is being conducted as part of NCHRP 3-78 and other studies. The authors recommend caution in establishing a California-wide policy until that research is complete.

- Current U.S. design methods to accommodate bicyclists of a range of abilities—allowing cyclists to circulate as vehicles or as pedestrians—appear to be appropriate. This includes the provision of a wider sidewalk or shared path around the perimeter of the roundabout and ramps to connect the sidewalk or path to the bicycle facilities on each leg as appropriate. The current U.S. recommendations to not stripe bike lanes within a roundabout help to address the exit-circulating conflict found in European experience. At multilane roundabouts, the evidence from this study suggests that it may be appropriate to use yield signs on a shared path around the roundabout, as many cyclists are riding rather than walking their bicycles.

The authors recommend close coordination with the ongoing NCHRP 3-65A project to produce a second edition of the FHWA Guide. It is anticipated that many of the recommendations in this report will be considered by that project.

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Appendix A: Annotated Bibliography

This Annotated Bibliography provides detailed information pertaining to the selected literature cited in the report. This literature is grouped into five categories: (1) State Guidelines and Research Documents; (2) Application and Policy; (3) Geometric Design; (4) Safety; and (5) Pedestrian and Bicycles.

A.1. State Guidelines and Research Documents

A.1.1. California Department of Transportation (Caltrans). "Design Information Bulletin 80-01". California Department of Transportation, Division of Design, Office of Geometric Design Standards, October 2003.

Caltrans provides guidance in the form of a Design Information Bulletin (DIB) that serves as a supplement to the FHWA guide. After the publication of the FHWA guide, Caltrans updated its previously published DIB on Roundabouts dated September 8, 1998. The current version, DIB 80-01, is dated October 3, 2003. Besides providing a general description of its policy, some background, and its applicability of the DIB, it includes an Attachment A. Attachment A spells out Caltrans design requirements which overlay and supplement those addressed in the FHWA guide.

Attachment A provides two more term definitions: approach and intersection. In terms of treatment of pedestrian crossings, it clarifies that the location of the pedestrian crosswalk is measured from the inscribed circle at both entry and exit. The crosswalk at multi-lane roundabouts should be located two-car lengths from the inscribed circle. In all cases, the pedestrian crossing shall be no closer than 6 m from the inscribed circle.

The document recommends a 6.5-second critical gap as the initial value for calculating intersection sight distance; however, the design speed and speed consistency through the circulatory roadway must be checked to ensure that the target speed is accomplished through the roundabout. Otherwise, modification on the initial critical gap value may be necessary, with a minimum of 5.0 seconds.

For crosswalks, it recommends use of a "ladder" type crosswalk on state highways to make the crossing location more visible to both drivers and pedestrians.

A.1.2. Saito, M., and M. Lowery. "Evaluation of Four Recent Traffic and Safety Initiatives: Volume 1: Developing Guidelines for Roundabouts (Report No. UT-04.10)". Utah Department of Transportation Research and Development Division, October 2005.

Field observations were conducted in this study at four roundabout locations in Utah during the a.m., p.m., and off-peak periods in the summer of 2003. The report summarizes the key issues concerning roundabouts and provides preliminary draft design guidelines and policies for roundabouts. This report does not provide as much detailed information about geometric design and operational analyses as those prepared in other states.

A.1.3. Kentucky Community Transportation Innovation Academy. "Modern Roundabouts: a Guide for Application". Kentucky Community Transportation Innovation Academy, 2005.

This guide document is very short. It includes some general concepts, example applications, and design considerations of roundabouts as a form of intersection control that can be considered by communities and transportation professionals. This document is not intended to include detailed information for the planning, design, and operation of roundabouts. More detailed practice relies heavily on the FHWA guide.

A.1.4. Wisconsin Department of Transportation. "Facilities Development Manual Design Chapter, Roundabouts Section", July 2005.

WisDOT adopted the design principles described in the FHWA guide and published the roundabout design guide as a portion of the WisDOT Facilities Development Manual (FDM) published in July 2005. This guideline incorporates the design principles from British roundabout guidance and recommended computer software "RODEL" for capacity and safety analyses to supplement the FHWA guide.

The document includes a section of recommended design procedures. It identifies three phases for a roundabout project: feasibility; alternatives analysis and preliminary design; and final design. A feasibility study includes crash evaluation, intersection capacity evaluation, queue storage evaluation, and unconventional intersection geometry evaluation. The process to determine the location of the roundabout should consider these issues: adjacent intersections; highway segments and coordinated signal systems; entry lanes and volume balance; approach alignment; pedestrian and bicyclist accommodations; transit, large vehicle and emergency vehicle considerations; social, environment, and economic considerations; and access management.

WisDOT's guidelines provide some useful information that may be beneficial to this project and Caltrans practice on roundabouts. For example, Wisconsin DOT established a roundabout design review process to ensure that roundabouts are properly selected and designed to meet a balance of needs (WisDOT, FDM Procedure 11-26-1). The WisDOT's guide discussed the issues related to roundabout installation in an arterial network, closely spaced roundabouts, and roundabout interchange ramp terminals in much more detail.

A.1.5. Kittelson & Associates, Inc., and TranSystems Corp. "Kansas Roundabout Guide: a Supplement to FHWA's Roundabout an Informational Guide", October 2000.

Kittelson & Associates, Inc. developed a statewide roundabout guide for the Kansas Department of Transportation as a supplement to the FHWA guide. The Kansas guide is intended to provide consistent information regarding the planning, design, construction, and operation of roundabouts in Kansas.

The outline of the Kansas Roundabout Guide is similar to the FHWA guide. It provides more detailed site selection guidance in the planning section (Chapter 3), which identifies locations, and conditions where roundabouts are often advantageous over

other traffic controls and sites where caution should be exercised with roundabouts. The operational analysis procedures in the Kansas guide totally adopts the FHWA guide, with simplified statements about traffic volumes, single-lane roundabout capacity, double-lane roundabout capacity, pedestrian effects on entry capacity, queues, and delay.

Similar to the FHWA guide, three key performance measures are used to assess the operating performance for a particular roundabout design: degree of saturation, delay, and queue length. For design purpose, KDOT adopts 0.85 as the maximum volume-to-capacity ratio for satisfactory operation and the 95th-percntile queue length to estimate the maximum resulting queue for a given approach. Furthermore, control delay is used to represent the delay component of roundabout performance in Kansas, as it is the same measure used for other types of intersections. An example operational analysis summary table is provided to summarize these three measures for each proposed roundabout.

In the Geometric Design chapter, the Kansas guide recommends a procedure for designing a roundabout, based on Exhibit 6-2: Roundabout Design Process in the FHWA guide. Fundamental principles are discussed in this guide about design speed, speed consistency, approach alignment, angles between approaches, and design vehicle. Some higher maximum entry design speeds are recommended in the Kansas guide. For example, maximum entry design speed of an urban single-lane roundabout recommended by the Kansas guide is 25 miles per hour, compared to 20 miles per hour in the FHWA guide.

A.1.6. Lee Engineering, L.L.C., and Kittelson & Associates, Inc. "Roundabouts: an Arizona Case Study and Design Guidelines". Lee Engineering, L.L.C., July 2003.

The report addresses a case study of the first roundabout in Arizona, located at the I-17/Happy Valley Road interchange. The objective of the study was to identify possible improvements that could be incorporated at this location and into future Arizona Department of Transportation roundabout initiatives. Guidelines were developed for designing roundabouts in the State of Arizona. The guidelines are similar to the FHWA Guide; however, some minor deviations were found in design parameters such as entry design speed and inscribed circle diameter.

A.1.7. Pennsylvania Department of Transportation. "Guide to Roundabouts". Publication No. 414. May 2001.

The Pennsylvania Department of Transportation's "Guide to Roundabouts" is developed as a supplement to the FHWA guide. This document will aid transportation professionals and engineers in determining whether a roundabout is a feasible alternative for a specific location.

This guide provides an array of questions and insights that can be applied in the preliminary design of intersections. Site and traffic characteristics determine the

benefits of using a roundabout at a particular location. This guide is intended to help determine which intersections are best suited for roundabouts.

The Pennsylvania guide begins with a detailed description of modern roundabouts. Differences between modern roundabouts and traffic circles are described, and the benefits of implementing a roundabout are discussed. The core of the guide is a questionnaire that directs transportation professionals and engineers toward a decision regarding the feasibility of implementing a roundabout. The questions are applicable to either the planning or study phases of the design process. Following the questionnaire, there are several important issues discussed regarding pedestrians, bicyclists, and public education. Several case studies are also included to facilitate the design process.

A.1.8. New York State Department of Transportation. "Highway Design Manual Chapter 26: Roundabout". 2001.

The guidelines for the New York State Department of Transportation are contained in chapter 26 of the *Highway Design Manual* and rely heavily on the FHWA guide. Many of the figures and tables are taken directly from the FHWA guide, although some have been modified slightly to reflect the standards of New York State Department of Transportation. The operation analyses and geometric parameters are mostly based on the British standards.

A.1.9. Taekratok, T. "Modern Roundabouts for Oregon (Report No. #98-SRS-522)". Oregon Department of Transportation Research Unit, June 1998.

This report provides a comprehensive review of current research and practice on modern roundabouts, both in the U.S. and internationally. The report compares the advantages and disadvantages of roundabouts, summarizes safety implications, and discusses pedestrian and bicyclist considerations. Three software models for roundabouts—ARCADY, RODEL, and SIDRA—are compared, and some issues are raised for future considerations. For example, SIDRA showed an agreement between delay output and field data at low-volume roundabouts, but the model underestimated the results at higher volumes. The report also includes French recommendations on handling public transit at roundabouts.

A.2. Application and Policy Consideration

A.2.1. Retting, R. A., et al. "Traffic Flow and Public Opinion: Newly Installed Roundabouts in New Hampshire, New York, and Washington". CD-ROM, TRB 2006 Annual Meeting, 2006.

The author suggests that roundabouts can provide substantial safety and traffic flow benefits compared with conventional intersections, but are opposed in the planning stage by local residents and elected officials who question their effectiveness. The purpose of this study was to measure public opinion before and after construction of roundabouts in several communities, and to evaluate the impact of roundabout construction on traffic flow. Three communities where stop-sign or traffic-signal-controlled intersections were replaced with roundabouts in 2004 were the subjects of this research. Overall, 36 percent of drivers supported the roundabouts before

construction, compared to 50 percent shortly after construction. Roundabouts had very positive effects on traffic flow. Average intersection delays during peak hours at the three sites were reduced by 83 to 93 percent. Traffic congestion, as measured by the vehicle-to-capacity ratio, was reduced by 58 to 84 percent. These results provide further evidence that roundabouts can improve traffic flow and that public support for roundabouts increases after they are in place.

A.2.2. Kyte, M., et al. "Characteristics of Modern Roundabouts in the United States: A Summary of the NCHRP 3-65 Operations Database". CD-ROM, TRB 2006 Annual Meeting, 2006.

This paper describes the basic characteristics of the more than 300 modern roundabouts that have been constructed in the United States since 1990. The paper also describes the traffic operations data that were collected at a subset of these sites, 474 hours of data recorded at 31 sites throughout the U.S. The database that has been assembled is the most extensive to date for U.S. conditions. Changes to the *Highway Capacity Manual*, and other standard traffic engineering references, will be made based on the conclusions drawn from this database. Eventually, the database will be made available to other researchers investigating the many other research problems that remain unanswered regarding roundabout operations. The database will also serve as a benchmark for changes in capacity flow rates at U.S. roundabouts as design, usage, and driver behavior mature over time.

A.2.3. Rodegerdts, L.A. "State-of-the-Art in U.S. Roundabout Practice". Institute of Transportation Engineers 2005 Annual Meeting, Melbourne, August 2005.

This paper presents the author's view on the current state of practice in the United States, including a vision of the coming years. The issues addressed in this paper include safety analysis, operational analysis, geometric design, multilane roundabout issues, and illumination. The author believes that roundabout practice in the U.S. will continue to evolve over the coming years. The practice has improved considerably with the publication of the FHWA and state roundabout guides and continued guidance from experts. The technical issue of properly accommodating non-motorized users, particularly pedestrians with visual impairments, is likely to continue to dominate the U.S. debate.

A.2.4. E.R. Russell, G. Luttrell, M. Rys. "Roundabout Study in KANSAS". 4th Transportation Specialty Conference of the Canadian Society for Civil Engineering, Jun 2002.

The Kansas Department of Transportation became interested in roundabouts in 1998 and started designing and building roundabouts on state highways in Kansas. They sponsored three research projects to gather before and after data at several Kansas roundabout locations. These studies are ongoing at Kansas State University. Concurrently, the City of Manhattan's traffic engineer chose a roundabout over other options when confronted with a high crash rate at the intersection of two residential collector streets with two-way stop control. The City cosponsored a project with Mack Blackwell Transportation Center to compare the traffic operations of the roundabout

with other options. The Insurance Institute for Highway Safety funded an additional project to gather before and after data and analyze operation of roundabouts in Harford County, Maryland; Hutchinson, Kansas; and Reno, Nevada. The paper reviews the data collection and analysis techniques and present results of several comparisons of roundabouts to other types of traffic control that show that the roundabout is superior to almost every other type of traffic control based on the measures of effectiveness used. The results of the analysis led the authors to conclude that roundabouts are the safest and most effective type of intersection traffic control available today. The paper also presents a brief review of some public opposition.

A.2.5. National Cooperative Highway Research Program (NCHRP). "Modern Roundabout Practice in the United States", A Synthesis of Highway Practice, NCHRP, Washington, D.C., 1998.

This synthesis is a comprehensive summary of current practices related to modern roundabouts in the United States. It presents the results of a survey conducted of departments of transportation throughout the United States and Canada. These results illustrate the perception and use of roundabouts today. It further examines the current state guidelines and various international guidelines. The report addresses safety, capacity, pedestrian, and bicyclist concerns and suggests a methodology for determining where roundabouts are appropriate.

A.3. Geometric Design

A.3.1. Thomas, G., et al. "Rural Roundabout and Their Application in New Zealand", Web document.

This paper presents research results on design and operational guidelines required for safe application of rural roundabouts. It documents current national and international practices, and defines a set of criteria and recommendations suitable for New Zealand.

The speed (v) of a vehicle on a circular path is related to the path radius (R) as follows:

$$(e+f)=\frac{v^2}{gR}$$

where e is the superelevation, f is the coefficient of sideways friction, and g is the acceleration due to gravity. The value for the design side friction coefficient varies with vehicle speed, and Austroads (1999) suggests that the maximum design value be 0.35 at 50 km/h, decreasing to 0.11 at 120 km/h for rural road design.

The safe intersection sight distance (SISD) comprises the distance approaching vehicles travel at the 85th percentile operating speed with an alerted stopping distance in 3 seconds (the observation time). It can be estimated as follows:

$$SISD = T_0V + R_TV + \frac{V^2}{2d}$$

where T_0 is the observation time (3 s), R_T is the perception-reaction time, V is the initial speed of approaching vehicles, and d is the deceleration rate of approaching vehicles.

A.3.2. Akcelik, R. "Estimating Negotiation Radius, Distance and Speed for Vehicles Using Roundabouts", Sydney, Australia: 24th Conference of Australian Institutes of Transport Research, December 2002.

This paper discusses models for estimating negotiation radius, distance, and speed values of through and turning vehicles at roundabouts. This model is based on the method introduced in aaSIDRA version 2.0. aaSIDRA version 2.1 introduced a new method for estimating the side friction factor as a function of speed.

Figures showing simplified constructions of vehicle paths for through, left-turning, and right-turning vehicles are given. The method for determining negotiation radius, distance, and speed of vehicles at roundabouts allows for path smoothing by drivers. Vehicle paths are constructed using the entry and exit curb line arcs, inscribed and central island circles, and a layout circle. The safe negotiation speed formula uses a side friction factor that is a function of vehicle mass. Graphs showing the side friction factor as a function of vehicle mass, and negotiation speed as a function of turn radius are presented.

The negotiation radius, distance, and speed values as a function of the roundabouts size are given for through, left-turn and right-turn movements. Graphs are given to show the sensitivity of average geometric delay for through, left-turn and right-turn movements to 1) roundabout size and 2) approach and exit cruise speeds.

A.3.3. Baranowski, B. et al. "Alternate Design Methods for Pedestrian Safety at Roundabout Entries and Exits: Crash Studies and Design Practices in Australia, France, Great Britain and the USA". Transportation Engineer, RoundaboutsUSA, Provo, UT, USA

The paper and presentation discuss study results of pedestrian/vehicle crashes and design practices at roundabouts in Australia, France, Great Britain, and the U.S. There are conflicting roundabout design practices among transportation engineers in the U.S., with alternate opinions and claims about the safe design of entries and exits for both single-lane and multi-lane roundabouts. This paper compares two recent designs constructed in the U.S. that use alternate design methods to reduce travel speeds. The meeting presentation illustrated various alternate design applications at roundabouts currently operating in the U.S.

This paper came about as the result of the authors observing roundabout designers in the U.S. who, in an attempt to slow exiting traffic to protect pedestrians, have constructed roundabouts with excessively tight exit radii. This practice has resulted in roundabouts with unnecessarily low capacity and high vehicle crash rates in some cases. This paper makes a case for the design of high capacity roundabouts that are safe for pedestrians.

A.3.4. Campbell, D., et al. "Improved Multi-lane Roundabout Designs for Cyclists". Web Document, GHD Ltd, 2004.

In 2004, GHD Ltd was engaged to improve multilane roundabout designs for cyclists, as part of Land Transport New Zealand's 2004–2005 research programs. This paper is a summary of the project. Duncan Campbell (GHD Ltd) also completed a Masters thesis that included further work on this subject.

Multilane roundabouts are generally viewed by experienced cyclists as a reasonably hazardous element of the road network to be avoided if conveniently possible. A literature review, an analysis of crash statistics in Auckland, and a survey of cyclists confirmed the original focus of this research, which was to design a low-speed multi-lane roundabout for on-road cyclists. This should substantially treat the critical "entering vehicle versus circulating cyclist" crash type, and is anticipated to address roundabout exits, which are the other main safety concern of bike riders. Good street lighting is also imperative, as nighttime crashes comprise a significant proportion of Auckland cyclist crashes at these types of junctions.

The design of a roundabout that reduces maximum car speeds to 30 km/h rather than the conventional 50 km/h requires a confined geometry. The outcome of this research project is the Cyclist Roundabout, or "C" Roundabout, which requires a narrow roundabout entry that requires larger vehicles to straddle both entry lanes. An alternative measure is the use of vertical deflection devices on roundabout approaches. While these devices have implications for bus passenger comfort, and emergency and heavy vehicles, they are an economic form of speed reduction for roundabout entries compared to substantial roundabout redesign.

The "C" Roundabout is a design that may not be suitable for every intersection situation. Rather it is hoped that the design concept demonstrated here, will be taken into consideration alongside other options for any new intersection designs or improvements. In the context of improving the road network for cyclists, the "C" Roundabout is just another tool at the traffic engineer's disposal.

A.4. Safety

A.4.1. Al-Ghirbal, A., et al. "Prediction Severe Accident Rates at Roundabouts Using Poisson Distribution". TRB 2006 Annual Meeting CD-ROM, 2006.

The author argues that highway engineers have been interested in the safety aspects of roadway design since the inception of transportation engineering. Conventionally, the most practicable measure to evaluate the level of safety for an existing highway facility is historical accident records or, for a proposed facility, prediction of accident rates. Because at-grade intersections are the areas of the highway network most likely to experience higher accident rates because of the presence of conflict points, these intersections deserve considerable attention from highway engineers studying safety issues.

Roundabouts are becoming acceptable as a feasible alternative to other types of at-grade intersections. This is due to their distinct advantages with respect to safety and smooth traffic movement, especially for moderate levels of traffic flow.

This paper focuses on the development of an accident prediction model to enable engineers and designers to appreciate the effects of different design features of roundabouts. Accidents that occurred at several roundabouts in Bahrain over the period from 1991–2002 were analyzed. The different geometric and traffic characteristics were used as the input parameters in the model to estimate their significance for traffic safety at roundabouts. The GLIM statistical package is utilized to develop a statistical model that relates these characteristics with the level of safety.

A.4.2. Russell, E.R., et al. "Can Modern Roundabouts Safely Accommodate All Users?" Web Document,
http://www.mtjengineering.com/pdfs/Gene_Russel_Paper.pdf

These authors studied the safety, operational, and environmental benefits of roundabouts for motorists for several years. Research in recent years has documented significant safety benefits, particularly in decreased injury crashes and fatalities, when modern roundabouts have replaced stop sign and traffic signal control. One reliable U.S. study concluded that where roundabouts replace stop signs and traffic signals, overall crashes are reduced 39 percent, injury crashes are reduced 76 percent and fatal crashes are predicted to decrease 90 percent. Roundabouts have the potential to save thousands of motorists' lives. Research results also have concluded that roundabouts significantly reduce delay, stopping, queuing, and motor vehicle emissions.

The effects on pedestrians and bicycles have not been studied much in the United States; however, international studies indicate that roundabouts are safer for pedestrians than intersections with conventional traffic control and no more dangerous for bicyclists. There is concern that roundabouts are not accessible to blind and visually impaired pedestrians and the access-board has put language in draft guidelines that would require pedestrian signals at all roundabouts. The challenge is to find a solution(s) to make roundabouts accessible without slowing or stopping their growth, which could negate the life saving benefits to motorists. This paper presents the issues involved in finding a balance that will accommodate and benefit all roundabout users.

A.4.3. Marco, R., et al. "Model to Evaluate Potential Accident Rate at Roundabouts". Journal of Transportation Engineering, Volume 130, Issue 5, pp. 602-609 September/October 2004.

This paper states that the increasing use of roundabouts calls for an evaluation of the potential accident rate for this kind of intersection. This gives a further element for the choice between alternative typologies of intersection for the re-qualification and the adjustment of road junctions. This paper presents a model to evaluate the potential accident rate in large and medium roundabouts. The model is based on dynamic considerations and on the user's behavior when crossing the intersection. The model's response to the traffic conditions in the intersection and to capacity formulations is also analyzed.

This paper defines some models to predict the crashes number. For example, the number of potential conflicts per time unit for collision due to failure to yield is defined as:

$$N_{1a} = Q_e \rho P(t_{\inf} \le t \le t_{\sup})$$

Where Q_e is the entering volume;

ρ is the traffic intensity;

$Q_e \rho$ is the number of entering vehicles that have to stop behind other vehicles before approaching the ring; and

$P(t_{\inf} \le t \le t_{\sup})$ is the portion of such vehicles $(Q_e \rho)$ that faces a gap between two vehicles circulating in the ring included in the band.

A.4.4. Stone, J.R., et al. "The Effects of Roundabouts on Pedestrian Safety". Southeastern Transportation Center, August 2002.

This project examines the safety aspects of modern roundabouts with respect to pedestrians. In the U.S., safety has been recognized as a major concern for the effectiveness of roundabout performance since their emergence. Pedestrians may be more prone to unsafe crossings at roundabouts due to new geometries, signalization (or lack of it), right-of-way assignments for pedestrians and vehicles, and visual and auditory cues. This project documents case study, statistical, and simulation analyses regarding pedestrian safety at roundabouts. The results suggest that roundabouts are safe with respect to pedestrians.

A.4.5. Persaud, B.N., et al. "Crash Reductions Following Installation of Roundabouts in the United States". ***American Journal of Public Health, Vol. 91, Issue 4 628-631.***

This study evaluated changes in motor vehicle crashes after 24 intersections were converted from stop sign and traffic signal control to modern roundabouts. These intersections were located in 8 states and were in a mix of urban, suburban, and rural environments. A before-after study was conducted using the empirical Bayes approach, which accounts for regression to the mean. Overall, the empirical Bayes procedure estimated statistically significant reductions of 39 percent for all crash severities combined and 76 percent for all injury crashes. Reductions in the numbers of fatal and incapacitating injury crashes were estimated at approximately 90 percent. Overall, results are consistent with numerous international studies and suggest that roundabout installation should be strongly promoted as an effective safety treatment for intersections.

A.5. Pedestrian and Bicycle

A.5.1. Ashmead, D.H., et al. "Street Crossing by Sighted and Blind Pedestrians at a Modern Roundabout". Journal of Transportation Engineering, Volume 131, Issue 11, pp. 812-821, November 2005.

This paper argues that pedestrian behavior and safety at roundabouts is not well understood, particularly for pedestrians with sensory or mobility impairments. A previous study, in which participants indicated when they would cross, suggested that blind pedestrians miss more crossing opportunities and make riskier judgments than sighted pedestrians. This study replicated these findings and analyzed actual street crossings. Six blind and six sighted pedestrians negotiated a double-lane urban roundabout under high and low traffic volumes. Blind participants waited three times longer to cross than sighted participants. About 6 percent of the blind participants' crossing attempts were judged dangerous enough to require intervention, compared to none for sighted pedestrians. Drivers yielded frequently on the entry lanes but not the exit lanes. Sighted participants accepted drivers' yields, where blind participants rarely did so. Auditory access to information about traffic and policy implications is discussed regarding accessibility of transportation systems.

A.5.2. Fortuijn, L. G. H. "Pedestrian and Bicycle-Friendly Roundabouts: Dilemma of Comfort and Safety". 2003 ITE Annual Meeting. Seattle, Washington, 2003

This paper addresses the circulatory speed of motorized traffic on roundabouts. For the safety of pedestrians and cyclists, the difference in speed between cars and bicycles at a conflict point is very important: a reduction in collision speed from 30 mph (48 km/h) to 20 mph (32 km/h) means that the risk of fatal injury is reduced from 45 percent to as little as 5 percent. The speed through roundabouts is determined by the vehicle path curvature. On single-lane roundabouts, an increase in the vehicle path curvature results in a reduction of vehicular accidents. On multi-lane roundabouts, however, increasing the vehicle path curvature can result in a higher potential for sideswipe collisions. On double-lane roundabouts, designers are faced with a dilemma: accepting a higher number of sideswipe collisions involving motorized traffic (when they increase vehicle path curvature by reducing the radius of the vehicle path) or accepting serious accidents involving pedestrians and cyclists (when they decrease vehicle path curvature). The turbo-roundabout offers a solution to this dilemma. This kind of roundabout is based on important principles applying to single-lane roundabouts: 1) no weaving traffic on the roundabout and 2) dealing with conflict points by means of slow speeds.

The paper also addresses the right-of-way regulations for cyclists and pedestrians; cyclists are usually given priority in the Netherlands. But in the case of roundabouts, this leads to a situation in which either safety or convenience is diminished. In attempts to resolve this dilemma, Dutch guidelines (as stated in CROW publication 126) recommend that within built-up areas, cyclists on the cycle track going around the roundabout be given right-of-way (for convenience) but that outside of built-up areas (and when another design is applied), they should not be given right-of-way (for reasons of safety). It is concluded that further research is needed to demonstrate the degree to

which roundabouts that give cyclists the right-of-way decrease their safety, even when given the best roundabout design possible.

Finally, this publication devotes attention to the design of cycle crossings for two double lanes. For pedestrians, a width of 3 m for the splitter island is sufficient to anticipate motorized traffic satisfactorily. The conclusion is that the higher speed of the cyclists places additional demands on the geometric design for creating sufficient anticipation time (offered by a jog).

A.5.3. Baranowski, B. "Pedestrian Crosswalk Signals at Roundabouts: Where are they Applicable?" ITE District 6 Annual Meeting CD-ROM, June 2004.

The proposed American Disability Act (ADA) Guidelines have recommended that traffic signals be located at all roundabout crosswalks to improve pedestrian safety and to allow for the crossing of the visually impaired. The author presents applications of pedestrian signals at roundabouts recently constructed in the U.S. and discusses examples located in Australia and Great Britain. Many engineers and planners feel that the decision to install pedestrian crosswalk signals at a roundabout or at mid-block locations should be made only where warranted, and should not be mandated by a blanket policy.

A.5.4. Singer, L.I., et al. "An Engineer's Dilemma: Accommodating the Needs of People with Disabilities at Modern Urban Roundabouts". Straits Knowledge 2002: www.straitsknowledge.com

Fundamental concerns are developing between those who must address traffic congestion and safety in older communities and stakeholders with special needs and protections under the Americans with Disabilities Act. These came into focus with an urban roundabout in Maryland.

Until these issues are resolved, the authors argue that traffic engineers must function within a framework lacking in standards and techniques to make roundabouts readily usable to pedestrians with disabilities, particularly blind pedestrians, while still adhering to engineering requirements. Representatives from various groups within this community come to the highway agency with distinctly different goals, frustrating the engineers' ability to satisfy their needs. Similarly, these stakeholders are becoming frustrated and fearful of the increasing use of a traffic management and calming tool, which appears to be anything but that for them. Some, in fact, argue urban roundabouts may be inherently unsafe for blind pedestrians. They also perceive unwillingness on the part of traffic engineers to meet their needs.

Indeed, the authors argue there is little in the way of common vocabulary or solutions that exist between traffic experts on the one hand, and blind pedestrians, their advocates, and accessibility and mobility experts on the other. While there is certainly emotion and conviction on both sides, there are few standards and guidelines for field application beyond ADAAG, which does not address situations such as roundabouts. This problem is particularly critical in older communities, which often can no longer

handle the traffic congestion typically found in downtown areas, as they undergo revitalization.

This paper presents some of the critical issues, various perspectives, and lessons Maryland learned through designing and constructing this modern urban roundabout. Some traditional and new approaches, including human factors elements that may be feasible in addressing these issues, are examined. Finally, a challenge is issued to find workable, field-level, multi-disciplinary solutions to provide industry-wide guidance for the future.

A.5.5. Access Board Research. "Pedestrian Access to Modern Roundabouts: Design and Operational Issues for Pedestrians Who Are Blind". Web document. http://www.access-board.gov/research/roundabouts/bulletin.htm#BACKGROUND

This paper states that roundabouts are replacing traditional intersections in many parts of the U.S. This trend has led to concerns about the accessibility of these free-flowing intersections to pedestrians who are blind and visually impaired. Most pedestrians who cross streets at roundabouts use their vision to identify a "crossable" gap between vehicles. While crossing, sighted pedestrians visually monitor the movements of approaching traffic and take evasive action when necessary. Blind pedestrians rely primarily on auditory information to make judgments about when it is appropriate to begin crossing a street. Little research has been conducted about the usefulness of such non-visual information for crossing streets at roundabouts. Recent research sponsored by the Access Board, the National Eye Institute, and the American Council of the Blind suggests that some roundabouts can present significant accessibility challenges and risks to the blind user. This bulletin:

- Summarizes orientation and mobility techniques used by pedestrians who are blind in traveling independently across streets;
- Highlights key differences between roundabouts and traditional intersections with respect to these techniques;
- Suggests approaches that may improve the accessibility of roundabouts to blind pedestrians; and
- Encourages transportation engineers and planners to implement and test design features to improve roundabout accessibility.

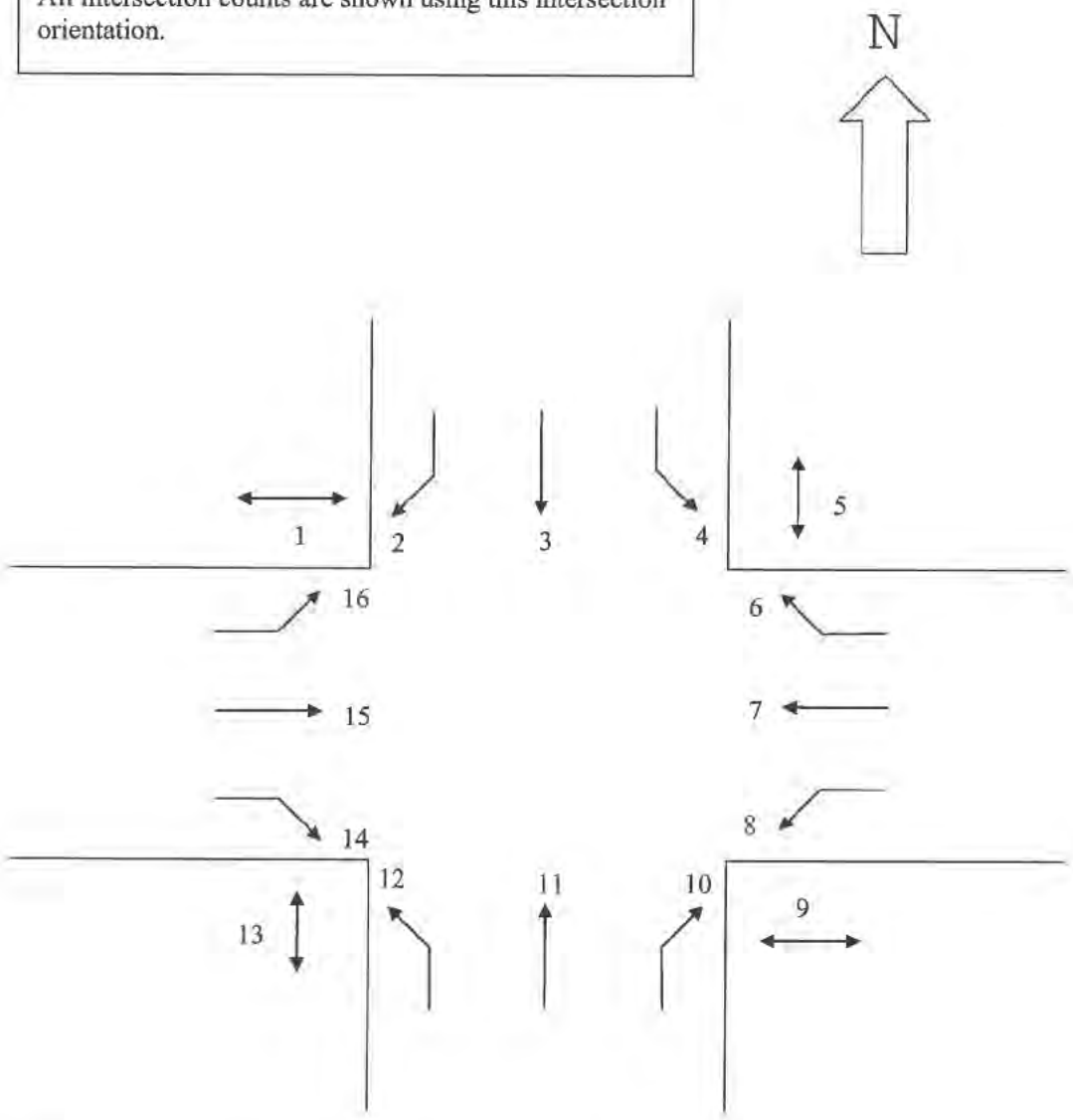
A.5.6. Swedish National Road and Transport Research Institute. "What Roundabout Design Provides the Highest Possible Safety?" Nordic Road & Transport Research, 2000, No.2, pp.17-21.

According to this study recently carried out by the VTI, roundabouts with a maximum permissible speed of 50 km/h are typically safer for motorists than grade-separated intersections. Single-lane roundabouts can be just as safe for cyclists as other types of intersection, and for pedestrians they are perhaps safer than any other type. Out of all of

the modes of transportation that travel through a roundabout, the bicycle is the most vulnerable. This study found that more bicyclists avoided the roundabouts than went through them. There are fewer bicycle accidents when the radius of the central island is greater than 10 meters and if there are special bicycle crossings. The VTI suggests that there be a distance of 2 to 5 meters between the roundabout and the bicycle crossing. A motorist entering a roundabout on the approach will be able to pay attention to cyclists on the crossings. Then, upon entering the roundabout, the motorist would have the space beyond the crossing to give way to the bicycles in the roundabout.

Appendix B – Count Data

All intersection counts are shown using this intersection orientation.



Movements 2,3,4,6,7,8,10,11,12,14,15,16 are bicycle movements

Movements 1,5,9,13 are pedestrian movements

RAW COUNTS

Washington Avenue and Montgomery Street, Orvoville CA Thursday 5/18/06 with North being Washington Street

2:30-6:00 PM	Southbound				Westbound				Northbound				Eastbound				
Start 15 Minute Intervals	1 (P)	2 (R)	3 (T)	4 (L)	5 (P)	6 (R)	7 (T)	8 (L)	9 (P)	10 (R)	11 (T)	12 (L)	13 (P)	14 (R)	15 (T)	16 (L)	Total
2:30	0	0	0	0	6	0	0	0	0	0	2	0	0	0	0	0	8
2:45	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	4
3:00	0	0	1	0	24	0	0	0	0	0	0	0	0	0	0	0	25
3:15	0	0	1	0	9	0	0	0	1	0	1	0	0	0	0	0	12
3:30	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	4
3:45	0	0	0	1	2	0	0	0	1	0	0	0	0	0	0	0	4
4:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4:15	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	3
4:30	0	0	3	0	3	0	0	0	0	0	2	2	0	0	0	0	10
4:45	0	0	0	0	2	0	3	0	0	0	0	0	0	0	0	0	5
5:00	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	2
5:15	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
5:30	1	0	1	0	2	0	0	0	0	0	0	0	0	0	3	0	7
5:45	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	0	8	1	59	0	3	0	4	0	6	2	0	0	3	0	87

*Attractions at intersection: Boss Burger restaurant

Total Pedestrians:	64
Total Bicycles:	23

Sylvan Avenue and Roselle Avenue in the city of Modesto Monday 5/22/06. Roselle runs north and south in the intersection.

2:30-6:00 PM	Southbound				Westbound				Northbound				Eastbound				
Start 15 Minute Intervals	1 (P)	2 (R)	3 (T)	4 (L)	5 (P)	6 (R)	7 (T)	8 (L)	9 (P)	10 (R)	11 (T)	12 (L)	13 (P)	14 (R)	15 (T)	16 (L)	Total
2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2
3:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	1	0	2	0	1	0	0	0	3	0	7

*There was construction near the intersection and no businesses nearby. There are homes located west of the intersection.

Total Pedestrians:	2
Total Bicycles:	5

Fresno Street/North Fresno Street/ Divisadero Street in Fresno Tuesday 5/23/06. North Fresno Street runs north and Fresno Street runs south.

2:30-6:00 PM	Southbound					Westbound			Northbound				Eastbound				
Start 15 Minute Intervals	1 (P)	2 (R)	3 (T)	4 (L)	5 (P)	6 (R)	7 (T)	8 (L)	9 (P)	10 (R)	11 (T)	12 (L)	13 (P)	14 (R)	15 (T)	16 (L)	Total
2:30	6	0	1	0	0	0	0	0	9	0	0	0	2	0	0	0	18
2:45	7	0	0	0	0	0	0	0	11	0	1	0	7	0	0	0	26
3:00	4	0	1	2	0	0	0	0	9	0	0	0	2	0	1	0	19
3:15	3	0	0	0	1	0	0	0	11	0	1	0	1	0	0	0	17
3:30	1	0	0	0	0	0	1	0	10	0	0	0	5	0	0	0	17
3:45	8	0	0	0	0	0	0	2	6	0	0	0	3	0	0	0	19
4:00	1	0	0	0	0	0	0	0	8	0	0	0	1	0	0	0	10
4:15	7	0	0	0	0	0	0	0	4	0	0	0	2	0	0	0	13
4:30	2	0	0	0	0	0	1	0	2	1	0	0	5	0	0	0	11
4:45	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0	0	5
5:00	2	0	1	0	0	0	0	0	5	0	0	0	4	0	0	0	12
5:15	1	0	0	1	0	0	0	0	2	0	2	0	3	0	0	0	9
5:30	3	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0	7
5:45	5	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	7
Total	**50**	**0**	**3**	**3**	**1**	**0**	**2**	**2**	**81**	**1**	**6**	**0**	**40**	**0**	**1**	**0**	**190**

*Medical Facilities are located all around the intersection.

Total Pedestrians:	172
Total Bicycles:	18

Main Street and Freedom Boulevard in Watsonville Wednesday 5/24/06. Freedom is the east leg, main constitutes south and west legs, and Southern Circle is the north leg.

2:30-6:00 PM	Southbound					Westbound			Northbound				Eastbound				
Start 15 Minute Intervals	1 (P)	2 (R)	3 (T)	4 (L)	5 (P)	6 (R)	7 (T)	8 (L)	9 (P)	10 (R)	11 (T)	12 (L)	13 (P)	14 (R)	15 (T)	16 (L)	Total
2:30	3	0	1	0	2	0	0	0	1	1	0	0	0	0	0	0	8
2:45	5	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	8
3:00	2	0	0	0	4	1	0	0	0	1	0	0	0	0	0	0	8
3:15	7	0	0	1	10	0	0	0	0	0	0	0	0	0	0	0	18
3:30	3	0	0	0	3	0	1	1	1	1	1	0	0	0	0	0	11
3:45	6	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	15
4:00	5	0	0	0	4	0	0	0	0	1	0	0	0	0	0	0	10
4:15	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	3
4:30	3	0	0	0	4	0	0	0	0	0	0	0	0	1	1	0	9
4:45	0	0	0	1	1	0	0	1	0	0	1	0	0	0	0	0	4
5:00	6	0	1	0	3	0	1	0	0	2	0	0	0	0	0	0	13
5:15	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4
5:30	3	0	1	0	4	0	0	2	0	0	0	0	0	0	0	0	10
5:45	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	**47**	**0**	**3**	**3**	**47**	**1**	**2**	**6**	**2**	**7**	**2**	**0**	**0**	**1**	**1**	**0**	**122**

* The local attractions are a church along with a diner and a fast food place at the intersection. Also in the area are hotels and an elementary school.

Total Pedestrians:	96
Total Bicycles:	26

Beach Street and Pacific Avenue in Santa Cruz Thursday 5/25/06. Pacific Avenue runs north and south.

2:30-6:00 PM	Southbound				Westbound				Northbound				Eastbound				
Start 15 Minute Intervals	1 (P)	2 (R)	3 (T)	4 (L)	5 (P)	6 (R)	7 (T)	8 (L)	9 (P)	10 (R)	11 (T)	12 (L)	13 (P)	14 (R)	15 (T)	16 (L)	Total
2:30	5	0	0	0	19	4	2	0	19	0	2	1	10	1	7	1	71
2:45	2	0	6	1	12	0	3	0	30	0	4	0	8	0	3	1	70
3:00	2	1	0	0	42	0	2	0	47	0	3	2	13	1	3	0	116
3:15	5	0	3	0	40	0	7	1	43	1	3	0	14	0	11	0	128
3:30	9	1	2	3	11	7	3	0	16	0	1	0	16	0	9	1	79
3:45	5	1	1	2	35	2	5	1	27	0	1	1	8	0	11	2	102
4:00	5	1	1	0	27	3	2	0	21	0	1	0	26	0	13	1	101
4:15	10	2	1	1	37	1	8	0	28	2	1	0	16	1	4	2	114
4:30	2	2	4	1	24	1	13	0	27	1	2	0	10	0	11	1	99
4:45	12	0	5	0	21	3	0	1	34	3	1	1	13	0	5	1	100
5:00	9	0	5	0	26	2	2	2	29	1	1	2	12	0	5	2	98
5:15	8	0	1	5	26	1	7	2	25	4	4	0	9	1	10	4	107
5:30	3	0	0	0	30	1	9	0	21	0	1	1	3	1	9	2	81
5:45	2	0	3	2	21	4	7	1	22	0	1	0	12	1	8	1	85
Total	79	8	32	15	371	29	70	8	389	12	26	8	170	6	109	19	1351

*The intersection is a very popular pedestrian intersection. The wharf runs south and there are hotels in all other directions around the intersection.

Total Pedestrians:	1009
Total Bicycles:	342

47th Street East and State Route 138 in Palmdale Wednesday 5/31/06. State Route 138 runs north and south.

2:30-6:00 PM	Southbound				Westbound				Northbound				Eastbound				
Start 15 Minute Intervals	1 (P)	2 (R)	3 (T)	4 (L)	5 (P)	6 (R)	7 (T)	8 (L)	9 (P)	10 (R)	11 (T)	12 (L)	13 (P)	14 (R)	15 (T)	16 (L)	Total
2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1

* There is a lot of developments such as Big 5 in the area but there isn't a high probability that people will have to cross this intersecion to get to the development.

Total Pedestrians:	0
Total Bicycles:	1

Junction of Highway 46 west and Route 101 in Paso Robles 6/01/06. Route 101 runs north and south.

2:30-6:00 PM	Southbound				Westbound				Northbound				Eastbound				
Start 15 Minute Intervals	1 (P)	2 (R)	3 (T)	4 (L)	5 (P)	6 (R)	7 (T)	8 (L)	9 (P)	10 (R)	11 (T)	12 (L)	13 (P)	14 (R)	15 (T)	16 (L)	Total
2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5:45	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**

* In the area are gas stations, fast food and motels but none of them require people to cross at the interection

Total Pedestrians:	2
Total Bicycles:	0

Gilman Street intersection at I-80 Berkeley Monday 6/05/06. I-80 runs north and south in the intersection.

2:30-6:00 PM	Southbound				Westbound				Northbound				Eastbound				
Start 15 Minute Intervals	1 (P)	2 (R)	3 (T)	4 (L)	5 (P)	6 (R)	7 (T)	8 (L)	9 (P)	10 (R)	11 (T)	12 (L)	13 (P)	14 (R)	15 (T)	16 (L)	Total
2:30	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
2:45	1	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	4
3:00	0	0	0	0	0	0	3	0	0	0	0	0	5	0	0	0	8
3:15	2	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	5
3:30	1	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	4
3:45	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	3
4:00	1	0	0	0	0	0	0	0	1	0	0	0	9	0	3	0	14
4:15	3	0	0	0	0	0	0	0	1	0	0	1	25	0	1	0	31
4:30	1	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	4
4:45	7	0	0	0	0	0	3	0	0	0	0	1	5	0	1	0	17
5:00	4	0	0	0	0	0	0	0	1	0	0	1	3	0	1	0	10
5:15	3	1	0	0	0	0	3	0	1	0	0	2	5	0	2	0	17
5:30	1	0	0	0	1	0	1	0	0	0	0	0	1	2	1	0	7
5:45	1	0	0	0	2	0	1	0	1	0	0	1	1	0	1	0	8
Total	**29**	**1**	**0**	**0**	**4**	**0**	**13**	**1**	**5**	**0**	**0**	**7**	**60**	**3**	**12**	**0**	**135**

* There were two intersections treated here as one intersection. The reason that they were treated as one intersection is because peds or bicycles traveling through one of the intersections had to travel through both interections. The reason is that bicycles and pedestrians aren't allowed to enter onto the freeway.
A major attraction in the area was the race track, which attracted a lot of the pedestrian and bicycle movement in the intersection.

Total Pedestrians:	98
Total Bicycles:	37

Alder Drive and Prosser Dam Road near Highway 89 near Truckee Tuesday 6/06/07. Highway 89 runs north and south.

2:30-6:00 PM	Southbound				Westbound				Northbound				Eastbound				
Start 15 Minute Intervals	1 (P)	2 (R)	3 (T)	4 (L)	5 (P)	6 (R)	7 (T)	8 (L)	9 (P)	10 (R)	11 (T)	12 (L)	13 (P)	14 (R)	15 (T)	16 (L)	Total
2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
5:00	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
5:15	0	0	0	0	0	0	0	1	0	0	9	0	0	0	0	0	10
5:30	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
5:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Total	0	0	1	0	0	0	0	1	0	2	12	0	1	0	1	0	18

*The only attraction near this intersection is a middle school that is located west on Alder Drive.
A group of touring bicyclists passed through at approximately 5:15 pm.

Total Pedestrians:	1
Total Bicycles:	17

Bear Street and State Route 28 in Kings Beach at Lake Tahoe Wednesday 6/07/06. Bear Street runs north from the intersection.

2:30-6:00 PM	Southbound				Westbound				Northbound				Eastbound				
Start 15 Minute Intervals	1 (P)	2 (R)	3 (T)	4 (L)	5 (P)	6 (R)	7 (T)	8 (L)	9 (P)	10 (R)	11 (T)	12 (L)	13 (P)	14 (R)	15 (T)	16 (L)	Total
2:30	10	0	2	0	0	0	0	0	8	0	0	0	7	0	0	0	27
2:45	13	1	4	0	1	2	1	0	6	0	0	0	12	0	0	0	40
3:00	9	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	13
3:15	4	0	0	0	0	0	0	0	6	0	0	2	7	0	2	0	21
3:30	7	0	0	0	2	0	0	0	3	0	1	0	4	0	0	0	17
3:45	2	3	0	0	0	0	1	0	10	0	1	0	11	0	0	1	29
4:00	4	0	0	0	0	0	1	0	0	0	0	0	13	0	1	0	19
4:15	2	1	1	0	0	0	1	0	1	0	0	0	8	2	2	0	18
4:30	11	0	3	0	2	0	0	0	6	0	0	0	18	0	0	0	40
4:45	3	1	1	1	0	0	1	0	4	0	0	0	13	0	0	1	25
5:00	5	0	0	0	1	0	1	0	3	0	0	0	12	0	1	1	24
5:15	3	2	0	0	2	1	1	0	5	0	3	0	10	0	0	0	27
5:30	2	1	0	1	0	0	3	0	0	0	0	0	3	0	1	3	14
5:45	8	1	1	0	0	0	1	0	0	1	0	0	7	0	1	0	20
Total	83	10	12	2	8	3	13	0	52	1	5	2	127	2	8	6	334

*The main attraction of the area would be the Kings Beach State Recreation Center.
There is also a coffe shop that is located across State Route 28 from the beach.

Total Pedestrians:	270
Total Bicycles:	64

EXHIBIT "C"

Kathleen Stanton, M.A.
Historic Resources Consultant

9/27/2021

City of Arcata
736 F St.,
Arcata, CA 95521

Re: Cultural Resources Chapter Review for Historic Resources, Draft Environmental Impact Report, Old Arcata Road Improvement Project.

Dear Council and Staff,
I have reviewed the DEIR and provide my comments here in hopes that you will reconsider the proposed Roundabout and adopt the Alternative project proposed by the neighborhood group, Bayside Cares. The EIR is extremely misleading in its assertion that there are no adverse effects to historical resources or historic properties. Although CEQA, NEPA and NHPA are stand alone statutes that each have to be complied with separately, I have combined my comments to address them all. The EIR's analysis to satisfy CEQA and federal compliance for NHPA Section 106 is based on faulty and incomplete data. There are numerous errors, omissions and misstatements throughout the EIR that do not support the findings of no adverse effects to historical resources.

AREA OF POTENTIAL EFFECTS (APE)

1) The APE maps (Figures #1-#10) that delineate the project boundaries were not available for public review and were redacted from the Historic Resources Report and removed from the City of Arcata's project website.

Withholding the APE Architectural Boundary Maps (Figures #1-#10) from the public is a violation of 36CFR800.3(e) and 800.2(d) and CEQA Section 15201. Public participation is a mandated and essential component for both. Without the relevant APE maps, the public was denied basic information regarding historical resources and historic properties that are NOT confidential in nature as are the locations of sensitive tribal resources or prehistoric archaeological sites.

City planning claimed that the APE maps were "Confidential" due to archaeological resources in the APE. The APE boundaries of the Archaeological Resources were included **on the same map** as the Architectural APE boundaries for Historical Resources. APE maps do not generally show sensitive or "Confidential" archaeological site locations and prehistoric data is not required in an Architectural Survey.

The location of known and potential Historical Resources are NOT "Confidential" information and the Architectural APE Maps for Historical Resources should have been made available to the public. There is no reason to limit the public's knowledge of the locations of known and potential historical resources in the project area for analysis and comment. On the contrary, withholding the APE Maps from the public releasee undermines the public's important review and comment role under CEQA, NEPA, and the NHPA.

2) The APE was inappropriately limited to include only the roadway and a few feet of private property along Old Arcata and Jacoby Creek Roads. The APE should consist of the totality of all contiguous parcels that may be affected by the proposed undertaking. In 2017, SHN consultants produced such an APE map entitled "Old Arcata Road Improvement Project Cultural Resources Existing Conditions" that showed the roadway as an APE Area of Direct Effects and a surrounding 500 foot corridor that included adjoining parcels as the Indirect Effects APE. (See Figure 1A)

This should have been the type of APE map for CEQA & Section 106 compliance for this project. Best Practices for conducting most historical surveys includes the parcel adjacent to the immediate project area. There was no support for the creation of a project boundary that extended only a few feet onto private property. This limitation in the geographic scope of the APE appears to be arbitrary and capricious.

CalTrans and the City of Arcata determined the APE boundaries on the basis that "no physical, visual or vibration effects" were going to adversely affect potential historical resources. (pg. 3.4-11) What proof did the Lead Agencies (CalTrans and the City of Arcata) have to substantiate that there would be no adverse effects to potential historical resources throughout most of the project area that hadn't been surveyed yet? How could the lead and responsible agencies make this conclusion prior to an historic resources survey by a qualified professional? How did they limit the APE to just six parcels? What proof was there that the road improvements would have no visual effects on the setting for a potential historic property that had not yet been identified by a survey? How did they define physical effects? How did they conclude that there would be no vibration effects?

It appears that the APE was gerrymandered to avoid creating an effect as defined by 36CFR800.16(i).

Per the EIR, the "Project corridor" along Old Arcata Road from Bayside Road (north) to Jacoby Creek Road (south), is "outside the APE". This conflicts with the APE Maps (Figures #1 - #10) which shows the entire project area within the APE and the Architectural APE. This conflicting data and the historic survey's limited scope calls into question the validity of the consultant's survey findings and impact assessments.

3) A "pedestrian survey of the **entire APE**" was conducted by one consultant on 9/10/2020 (pg. 3.4-11). However "Parcels outside the County right of way…were **not included in the APE**" (pg. 3.4-11). This suggests that the previously described "intensive" survey did not include any property within Arcata City limits, which is most of the project area.

Severely limiting the boundaries of the APE violates 36CFR800.16(d) and 36CFR800.5 and also presents an incomplete analysis of impacts under CEQA.

The EIR further describes the historical survey area as only "the area around the proposed new roundabout at Old Arcata Road and Jacoby Creek Road, including **six adjacent parcels** that could experience a visual impact." (pg. 3.4-11) The limited, six parcel survey area is inconsistent with previous statements about the consultant's "pedestrian survey of the **entire APE**" in the project area. This information about what was and wasn't surveyed in the APE is conflicting and may be misleading and is not easily understood by the public.

4) The EIR notes that the consultant's "fieldwork entailed examining and taking photographs of the resources **in and immediately adjacent to the APE**..." (pg. 3.4-11) There are no specific addresses or parcels that are identified as part of this "intensive" survey to know exactly what was surveyed and what was not. The reporting is contradictory and confusing and lacks documentation. "General" and "broad" observations were "made of the land use, surroundings, and setting." Again there is no documentation of these observations that eventually led to conclusions of No Adverse Effect to Historical Resources. (pg. 3.4-11)

The limited, six parcel survey area is not consistent with the APE Maps labeled Figures #1 - #10 which delineate an "Architectural APE" with a gold line around the entire project area from Bayside Road to the north, to Fairview and Jacoby Creek Road to the east, to 1972 Old Arcata Road to the south. This "Architectural APE" is never referred to in the text of the EIR nor were the maps identifying this "Architectural" area ever made available to the public.

To limit the historical survey to only 6 parcels at the southern end of the project area is insufficient to adequately identify the **location** of potential historical resources in the entire project area/Architectural APE or to assess the **setting** of each historic property and thus its National Register eligibility as required by Section 106.

The EIR erroneously states that "three historic-era (45 years or older) built environment resources" (2212 Jacoby Creek Road (MR 1), 1928 Old Arcata Road (MR 2), and 2297 Jacoby Creek Road (MR 3)) were noted "OUTSIDE the County right of way that are in the APE." (pg. 3.4-11). These three properties are actually OUTSIDE Arcata city limits, ADJACENT to the County right-of-way and INSIDE the County planning jurisdiction.

This is further evidence that the identified survey areas are conflicting in their scope and reporting, confusing to the public as to their locale and perhaps misleading. There were no general APE maps or Architectural APE maps available to the public to better understand where MR 1, MR 2 & MR 3 are specifically located in relation to the entire project area. Also, there is no information as to where the three other, unidentified parcels are located and why they were not considered historical resources for the purposes of CEQA. (pg. 3.4-11)

5) Two architectural properties located in the APE and Architectural APE were not surveyed or evaluated for National Register eligibility or inclusion in the California Register of Historical Resources. They include 1666 Old Arcata Road and 1972 Old Arcata Road. This violates Section

106 (36CFR60.4) and CEQA (PRC 21000, et. seq.) and the CEQA Guidelines (14CFR 15000, et. seq.) which requires lead agencies to identify, evaluate and protect individual or collective groupings of historic resources. This also violates CEQA's requirement, under PRC 21084.1, to analyze all potential historic resources that may be impacted by the Project.

These two properties are excellent examples of Spanish Eclectic architecture (McAlester & McAlester, 1991, pgs. 416 - 429) and would qualify for the National Register given their Architectural significance (36CFR60.4 Criterion C). They embody "The quality of significance in American history (and) architecture…that possess integrity of location, design, setting, materials, workmanship, feeling and association." And per CEQA/Criteria C, they embody "the distinctive characteristics of type, period, or method of construction…" To ignore these two properties (and many others that may be eligible for the National Register) violates 36CFR60.4. which the federal agency is ultimately responsible for ensuring is completed according to the regulations.

Many other potential historical properties were ignored and not surveyed within the "Architectural APE" (APE Figures #1 - #10). Within the project area (in Arcata city limits) there are approximately 58 post war era structures that date from 1945 - 1965 which is within the actual Period of Significance. (SHN 2017 Report.) In addition, there are 19 previously identified properties that were determined eligible for inclusion in an historic district in a previous 1978 survey. (See Figure 11, An Historic Resources Inventory, Humboldt County, 1978.)

None of these properties (that are clearly eligible for inclusion in the California Register and the NRHP/CRHR under criteria A/1) were evaluated for significance at the local and state level for their association with EVENTS (the Post War, Douglas Fir Logging Boom in Humboldt County) that have made a significant contribution to the broad patterns of our history. This violates both CEQA and Section 106.

City of Arcata General Plan 2020 Violations

The EIR violates numerous General Plan 2020 statutes including:
H-1: Historic Landmarks (To designate and preserve significant structures.)
H-1b: Local Historic Landmarks Designations (Structures or sites having special character or special historic, architectural, or aesthetic interest or value shall be designated as local Historic Landmarks.)
H-2: Add Bayside to the City's Historical Resources Inventory
H-4: Designate Bayside as a Neighborhood Conservation Area
H-4f: Prepare preservation measures for historic properties in the Bayside Specific Plan District

Bayside was designated in the City of Arcata's General Plan 2020 as a Specific Planning Area (SPD) with historic significance and potential as an historic district. (H-4f) The district eligibility requirement per the land use code, had already been met and all that was missing was a survey of

individual properties to "update (the) historical resources inventory...and add Bayside to (the) inventory. (H-2)

As the EIR reports, the survey for historic resources in the Bayside Specific Plan District was **limited to only four properties**, which was not the intent of the General Plan and violates H-2. The entire SPD per the map of the district includes properties on both sides of Old Arcata Road along much of the project area APE. (See Figure 12) Existing SPD designation was to lead to a Neighborhood Conservation Area designation which is the City's equivalent of an historic district (H-4). Furthermore, preservation measures were to be created to protect historic and noteworthy structures in these areas (H-4f). Because the boundaries of the APE were so severely limited (as previously demonstrated), no in-depth study of the built environment was conducted to "designate...(the) Bayside area as (a) Neighborhood Conservation Area." (H-4). This failed to follow the City's General Plan.

Humboldt County General Plan Violations
CU-G1: Protection and Enhancement of Significant Cultural Resources
CU-P1: Identification and Protection.
CU-P3: Consultation with other Historic Preservation Agencies and Organizations

The Connors-Lawlor-Wilson House at 1945 Old Arcata Road is currently listed on the National Register of Historic Places and was not included in the EIR report or impact analysis. (See OHP Letter 11/3/1978) This oversight violates the Humboldt County General Plan CU-G1 to protect known resources and CU-P1 to identify the potential for impacts to significant cultural resources during ministerial permit and discretionary project review.

Archival research was conducted, but there was no documented consultation with local historians or people knowledgeable about the history of Bayside which is standard practice for most historic resource surveys. This local consultation is required by the Humboldt County General Plan CU-P3. There is no record that local historians were consulted during the fieldwork to identify historic resources or that local residents were interviewed for their knowledge which would not be generally found in published secondary sources or in local annals or other archival records. (pg. 3.4-11) This oversight violates the Humboldt County General Plan CU-P3.

Historic Context - The historic context in the EIR is extremely limited in time (c.1875 to 1925) and does not represent Bayside's true Period of Significance which spans from 1860 (with the construction of the Beith House) to 1970 and includes the Post War era. The area's history does not end in the 1920s with the construction of Hwy. 101 as indicated by the EIR's limited research and reporting.

Nineteenth century Pioneer settlement associated with a burgeoning redwood industry and the transition into a modern 20th century community were certainly keystone periods in Bayside's history as reported in the EIR. Nothing, however, compared to what happened to Bayside and

Arcata between late 1945 and 1970 which might arguably be considered the most historic period of all in Bayside's 160 years.

The social and economic transformation after the war was unprecedented and the mid-century houses are important testaments to that time. Bayside's only post war housing subdivision, Bayside Heights, (also known as "Cadillac Hill"), is in the project area on Hyland Street, but was excluded from the survey as were approximately 58 other Ranch style houses. These post war resources are the physical embodiment of the area's mid-century history and are overlooked in the CEQA analysis due to the severely limited boundaries of the APE, the limited scope of the Historic Context and the narrow and inaccurate Period of Significance identified for the resources.

Today, mid-century modern houses are receiving more and more recognition for their place in history and many for their architectural merit. These houses are now over 50 years old and date within Bayside's historic Period of Significance (1860 - 1970). Age, however, is not the only criterion for valuing these houses and may, in fact, be the least important. The how and why of these buildings that are dotted along the Old Arcata Road as infill development and celebrated as custom homes in the Bayside Heights subdivision make them highly significant within the context of a post-war United States, Humboldt County, Arcata and Bayside. This was no backwater community. It participated in the American Dream with the rest of the Country and, in fact, made a major contribution to that dream with its production of the many different wood products needed to fuel the nation-wide housing boom.

Historical Resources in the APE:

The 1882 Temperance Hall at the corner of Old Arcata Road and Jacoby Creek Road was determined eligible for the NRHP/CRHR under Criteria A/1 at the local level for its significant association with **Community Development in Bayside** and is a historical resource under CEQA. "The period of significance is 1882 to 1970." (pg. 3.4-12) This is inconsistent with the Period of Significance from 1875 - 1925 as described in the Historic Context of the EIR.

What the determination of National Register eligibility fails to establish is that the building **ALSO qualifies for its Architectural Merit**. The EIR neglects to mention that the building is an outstanding example of Greek Revival Folk Architecture. It is a very simple, redwood building with gable end returns on the west, front facade and has a relatively steep roof pitch. This front gabled shape was particularly common in New England and remained a dominant folk form well into the 20th century. (McAlester and McAlester, 1991, pgs. 90, 192, 193). The Hall was very likely built from local redwood that was logged in Bayside, brought to Bayside Corners via the small railroad on Jacoby Creek Road and milled across the street at the Flanigan and Brosnan Co. Sawmill. Its old growth redwood **materials**, its **design** & its quality **workmanship** combine to create a truly unique building unlike anything found in Arcata, Eureka or Humboldt County.

Because the building also qualifies for the NRHP/CRHR under Criteria C/3 (Architecture), any changes to the building's **setting**, the character of the property's use or a physical feature within the property's **setting** that contributes to its historic significance is considered an adverse effect per 36CFR800.5 An affect is considered adverse when properties listed in or eligible for listing in the NRHP are subjected to these type of effects.

The Hall currently possesses integrity of historical **design** and **materials** and **workmanship** that will not be adversely effected. But the **location**, the **setting**, the **feeling** and **association** with the past will be materially impaired by bringing a busy road that is currently 111 feet away from the structure to within 45 feet of the front facade. The Temperance Hall meets all seven of the criteria for historical and architectural integrity, which makes it a very strong candidate for the National Register, the gold Standard for landmark designation.

The Old Arcata Road Improvement Project proposes to construct a 106' wide Roundabout within 45 feet of the Temperance Hall that will cause a substantial adverse change to the **setting** of the resource and **materially impair its visual prominence at Bayside Corners.** The old 1903 Schoolhouse (which is currently listed on the National Register) will suffer a similar plight. Its large belfry is in direct alignment with the Old Arcata Road (as seen in the iconic, 1947 Shuster photograph, see photo 1) and this connection between the road and the school or **viewshed** will be destroyed. The traffic from the Old Arcata Road will also move approximately 73 feet closer to the property.

By removing the remnants of the old T-Intersection and replacing it with a large, 106' diameter roundabout will fundamentally change the structural layout and historical design of Bayside Corners. It's the old T-intersection which creates a "corner" to the historical location known as Bayside Corners. The current configuration of the existing intersection has been there since 1947 & dates within the Period of Significance and should not be disturbed.

The **viewshed** of the Hall's Front Facade will also be impacted. Currently there is 111 feet of open space in front of the Hall that has been there for the last 74 years. (See photo 2) The property is owned by the County and the City is requesting an Encroachment Permit from the County to use this area for the Roundabout. (See Photo 3) The project will take approximately 66 feet of this open space and put a large roundabout in its place that will come within 45 feet of the building's front facade. (See Photo 4)

The modern roundabout would be an intrusive visual element that would diminish the integrity of four of the property's significant historic features: it's **setting**, it's historical **location at Bayside Corners** (which will be destroyed), it's **feeling** and **association** and connection to a country road, Jacoby Creek Road. To realign the Old Arcata Road from its current location that is 111 feet distance from the Hall to within 45 feet is a significant adverse change mostly affecting the Hall, but also the Old 1903 Jacoby Creek School and to some degree the 1941 Old Grange Hall. (See Photo 5)

The proposed roundabout will disrupt the old neighborhood **setting** with an immense, **paved traffic circle with center island, apron and 21 foot wide roadway** encircling it, with some **other "roadway widening and realignment; new sidewalks with curbs and gutters; three concrete traffic splitters, five towering streetlights** (where currently there is just one); **and numerous street signs, four directional arrows in the center circle; and several yield signs.** (See Figure 13) The intersection will no longer feel like a country road with several historic buildings, but an urban traffic zone. (See Figure 14)

The EIR claims that the open space in front of the Temperance Hall (which has been used as a gravel parking area for the past 74 years) is historically insignificant which is erroneous. The unofficial parking area is owned by the County and was created in 1946 with the realignment of Old Arcata Road at Bayside Corners. This area provides parking for approximately 26 cars and is used frequently during school hours when students are dropped off and picked up at Mistwood Elementary School, for events at the neighboring Grange/Community Hall and for bicycle enthusiasts who park here daily to recreate in the countryside as they ride up and down Jacoby Creek Road and into the neighboring woods.

The community uses this open space for important parking that helps support the commercial viability of the Temperance Hall which has been adaptively reused as a school and for the neighboring Old Grange which is a popular community hall. Parking helps keep these buildings viable for venues that help pay for their upkeep and their cyclical maintenance. These are important resources for Bayside and the surrounding communities of Arcata and Eureka. **Parking is essential to the continued preservation and successful adaptive use of these historic properties.**

Cumulative Impacts

The original Old Arcata Road as seen in the 1919 Sanborn Fire Insurance Map of Bayside Corners shows the historic T-Intersection and its relation to the Old 1882 Temperance Hall, the 1903 Jacoby Creek School and the 1887 Bayside Store (See Figure 15). An historic photo taken about 1940 shows Bayside Corners with these three historic buildings. (See Photo 6) In 1946 the T-Intersection was reconfigured into a wide, sweeping curve that demolished the old Store and was the first adverse impact to Bayside Corners. (See photo 7) As surviving photos of the store well document, the large, ornate commercial structure was worthy of preservation and would have been eligible for the National Register for architecture, association with local events and community development had it survived like its neighboring landmarks. (See photo 8)

Because there were no environmental laws protecting historic resources back in 1947, the Bayside community lost an important landmark and prominent feature at Bayside Corners. From the surviving photos, we can see clearly what was lost; a large, Folk Victorian structure with a huge stepped parapet on the front facade that was decorated with a shingled visor supported by nine elaborate, Victorian styled brackets. Below was a full facade front porch supported with five posts with flat sawn, Victorian brackets on either side. The decorative porch continued

around the sides of the building and the central entrance had double doors that were Victorian in design flanked on either side by huge fixed windows with divided lights. In photo #9, the Wilson Family (who owned and ran the store) stand proudly in front of the imposing structure.

Although the store didn't survive the modernist movement of the late 40s and 50s, fortunately, it was the only historic loss to Bayside Corners. The Old 1903 School and the 1882 Temperance Hall survived and one is listed on the National Register and the other is eligible and will be listed as a result of the survey. The old Grange, built in 1941, is located behind the Temperance Hall is also a landmark listed on the CA Register. So these three significant historical resources and a remnant of the old, original roadway remain at Bayside Corners.

As the current Google Earth Aerial Photo shows,(see photo 7) Bayside Corners is still intact with the old T-Intersection in situ and some of the original roadway actually remains in front of the Temperance Hall. As this visual evidence shows, the claim that, "Changes to the Bayside Corners community have diminished the historic character of the area that link it to its historic past" and therefore, there are no adverse effects to historical resources is a false narrative that is not supported by the evidence of what remains at Bayside Corners. (pg. 3.4-19) The old store is gone, but this loss hasn't substantially diminished the historic significance of Bayside Corners and doesn't negate the importance of what remains and should be preserved.

The proposed Roundabout will move the Old Arcata Road (which is now 111 feet to the west of the Temperance Hall), about 66 feet closer to the historical resource so the roadway, the traffic, the noise, the vibrations and the exhaust fumes from vehicles will come within 40 feet - 45 feet from the front facade of the old Hall. (See Photos 2, 3, 4, & 5) These are Adverse Effects per CEQA that will also negatively change the viewshed directly in front of the Hall. Similarly, with the construction of a Roundabout, the north bound traffic on Old Arcata Road will move 73 feet closer to the SW corner of 2212 Jacoby Creek Road which is the site of the 1903 Schoolhouse which is listed on the National Register. This will negatively affect the integrity of the **setting, feeling** and **association** with the past at Bayside Corners which is the historic nucleus of the community.

The effects of the past road project in 1946 taken together with the effect of the proposed road project to construct a large, urban traffic circle, or roundabout, in a rural historic landscape will significantly alter the physical location of Bayside Corners. This in turn will create changes to the **setting, feeling** and **association** of the location and the significant historical resources that reside there. These three important characteristics (that help define historic integrity) support the historic and architectural significance of the Old School and the Temperance Hall and if changed substantially as proposed, will negatively effect these historical resources.

One adverse impact to the historic integrity of Bayside Corners with the demolition of the old Store in 1947 was enough. Another adverse effect with the construction of a Roundabout within 45 feet of the Temperance Hall and 73 feet from the boundary of the Old School will create a

cumulative effect that is irreversible. Once the "Corners" is gone and replaced by a Roundabout the area will no longer reflect the historical development of the town and the old road that connected people to the historic nucleus of Bayside and the heart of the community. (See Figure 16)

Alternative to the Roundabout

There is a better Alternative which Bayside Cares supports and it is a more sensitive change to the existing roadway that is more compatible with the historical resources at Bayside Corners. (See Figure 17) The Alternative proposes two, narrow, ten foot lanes instead of two, twelve foot lanes. The Roundabout, in comparison, has a 21 foot wide roadway. The Alternative also provides a five foot bike lane which the Roundabout does not. Sidewalks and crosswalks will be placed in more optimal areas to better support the walkability of the area and safer passage for students and the elderly who cannot navigate a Roundabout easily.

This simpler Alternative was supported by 50% of the community in 2017 as reported by SHN who conducted the public Design Charrettes. It is only because the past City Council voted to support a Roundabout with NO PUBLIC HEARING, that we are still discussing a highly controversial project that doesn't fit a community that identifies itself as rural and historic.

Respectfully submitted,

Kathleen Stanton

Kathleen Stanton, M.A.
Historic Resources Consultant
Bayside, CA 95524

Figure 3. APE Map

See **Sheet 10** for resources in the Architectural APE labeled with Map Reference (MR) Numbers

Figure redacted due to archaeologically confidential content.

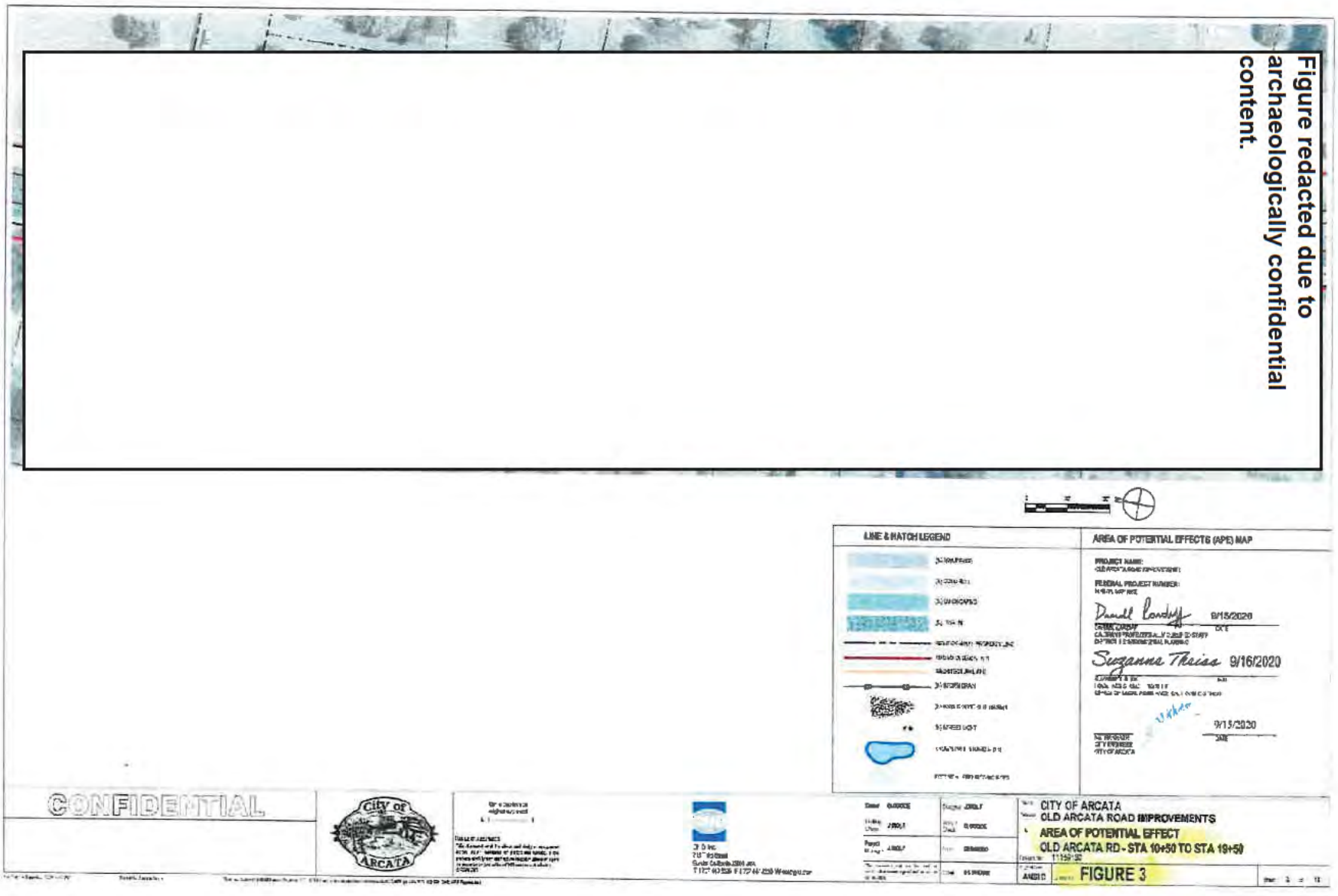


Figure redacted due to archaeologically confidential content.
LINE & HATCH LEGEND
AREA OF POTENTIAL EFFECTS (APE) MAP
PROJECT NAME:
FEDERAL PROJECT NUMBER:
Daniel Landry 9/15/2020
Suzanna Theiss 9/16/2020
9/15/2020
CONFIDENTIAL
City of Arcata
CITY OF ARCATA
OLD ARCATA ROAD IMPROVEMENTS
AREA OF POTENTIAL EFFECT
OLD ARCATA RD - STA 10+50 TO STA 19+50
FIGURE 3

Figure redacted due to archaeologically confidential content.

Figure redacted due to archaeologically confidential content.

Figure redacted due to archaeologically confidential content.

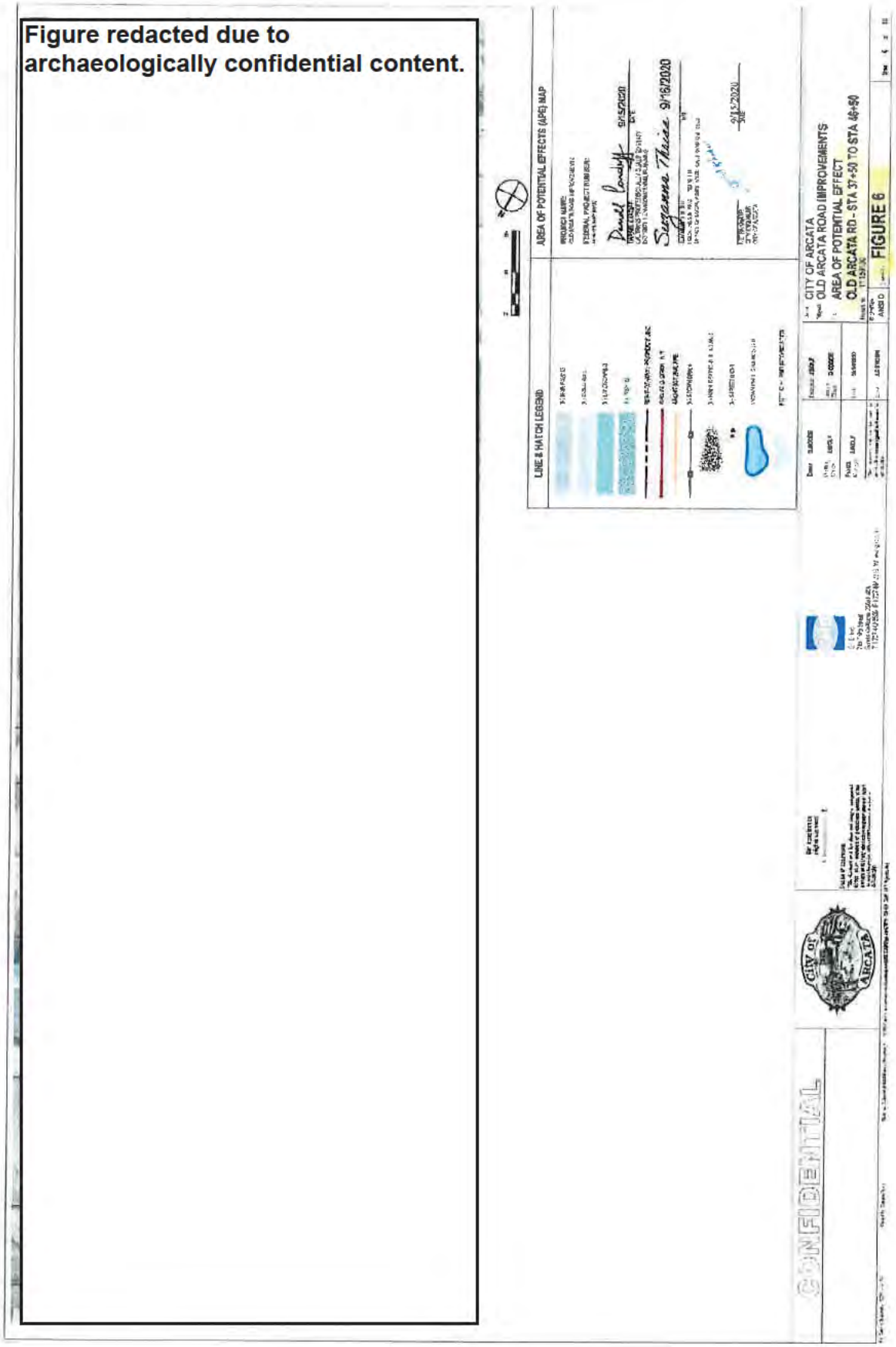


Figure redacted due to archaeologically confidential content.

LINE & HATCH LEGEND

AREA OF POTENTIAL EFFECTS (APE) MAP

PROJECT NAME:

FEDERAL PROJECT NUMBER:

9/15/2020

Suzanne Thiesa 9/16/2020

9/15/2020

CONFIDENTIAL

CITY OF ARCATA
OLD ARCATA ROAD IMPROVEMENTS
AREA OF POTENTIAL EFFECT
OLD ARCATA RD - STA 46+50 TO STA 52+00

FIGURE 7

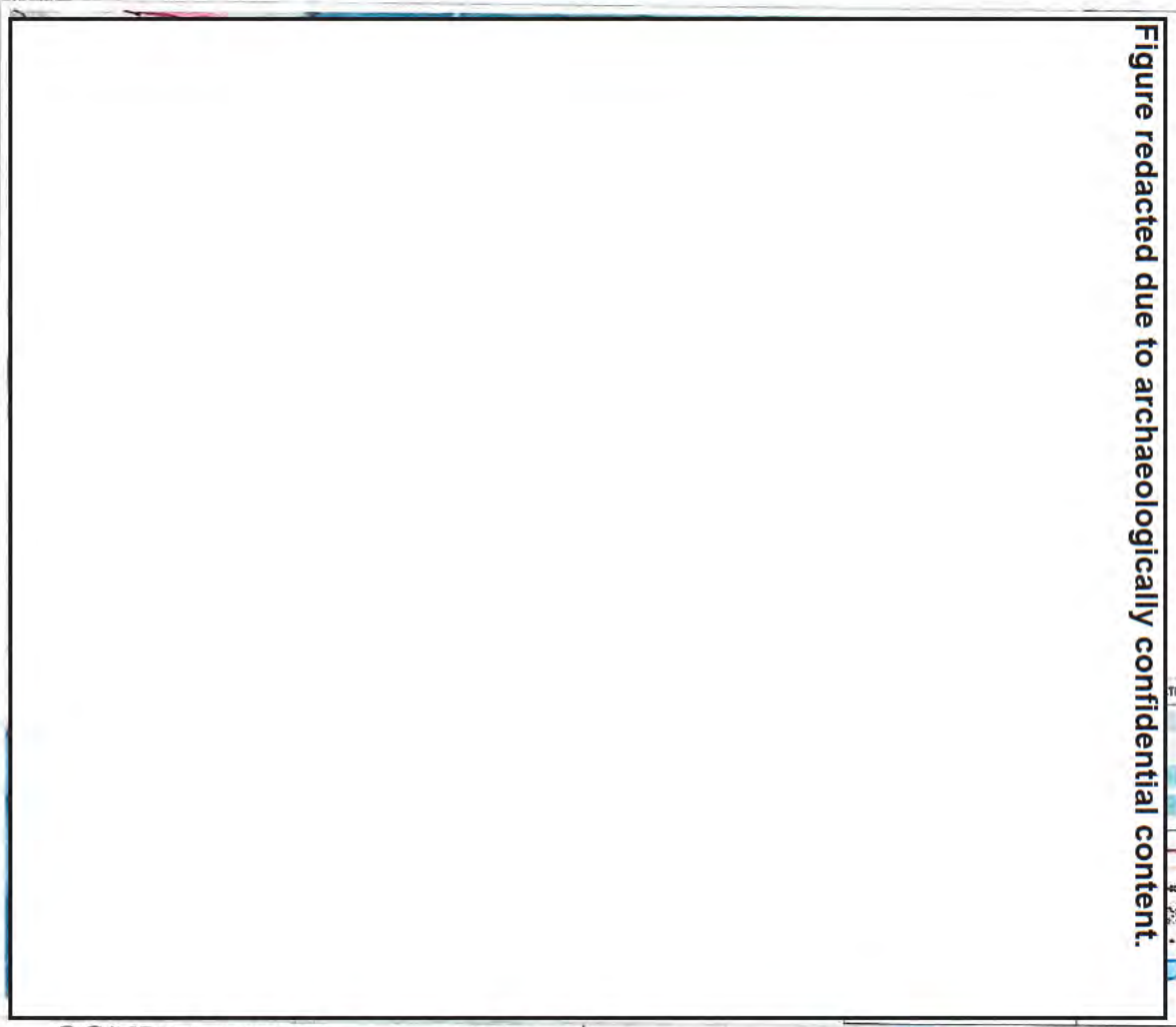


Figure redacted due to archaeologically confidential content.

CONFIDENTIAL

AREA OF POTENTIAL EFFECTS (APE) MAP

9/15/2020

9/16/2020

9/15/2020

CITY OF ARCATA
OLD ARCATA ROAD IMPROVEMENTS
AREA OF POTENTIAL EFFECT
OLD ARCATA RD CONTINUED & JACOBY CREEK ROAD

FIGURE 8

Figure redacted due to archaeologically confidential content.

LINE & HATCH LEGEND

AREA OF POTENTIAL EFFECTS (APE) MAP

PROJECT NAME:

FEDERAL PROJECT NUMBER:

Randall Landry 9/15/2020

Suzanne Theiss 9/16/2020

9/15/2020

CONFIDENTIAL

CITY OF ARCATA
OLD ARCATA ROAD IMPROVEMENTS
AREA OF POTENTIAL EFFECT
P-12-000103

FIGURE 9

Figure redacted due to archaeologically confidential content.

CH LEGEND

AREA OF POTENTIAL EFFECTS (APE) MAP

PROJECT NAME:
OLD ARCATA ROAD IMPROVEMENTS

FEDERAL PROJECT NUMBER:

9/15/2020

9/15/20

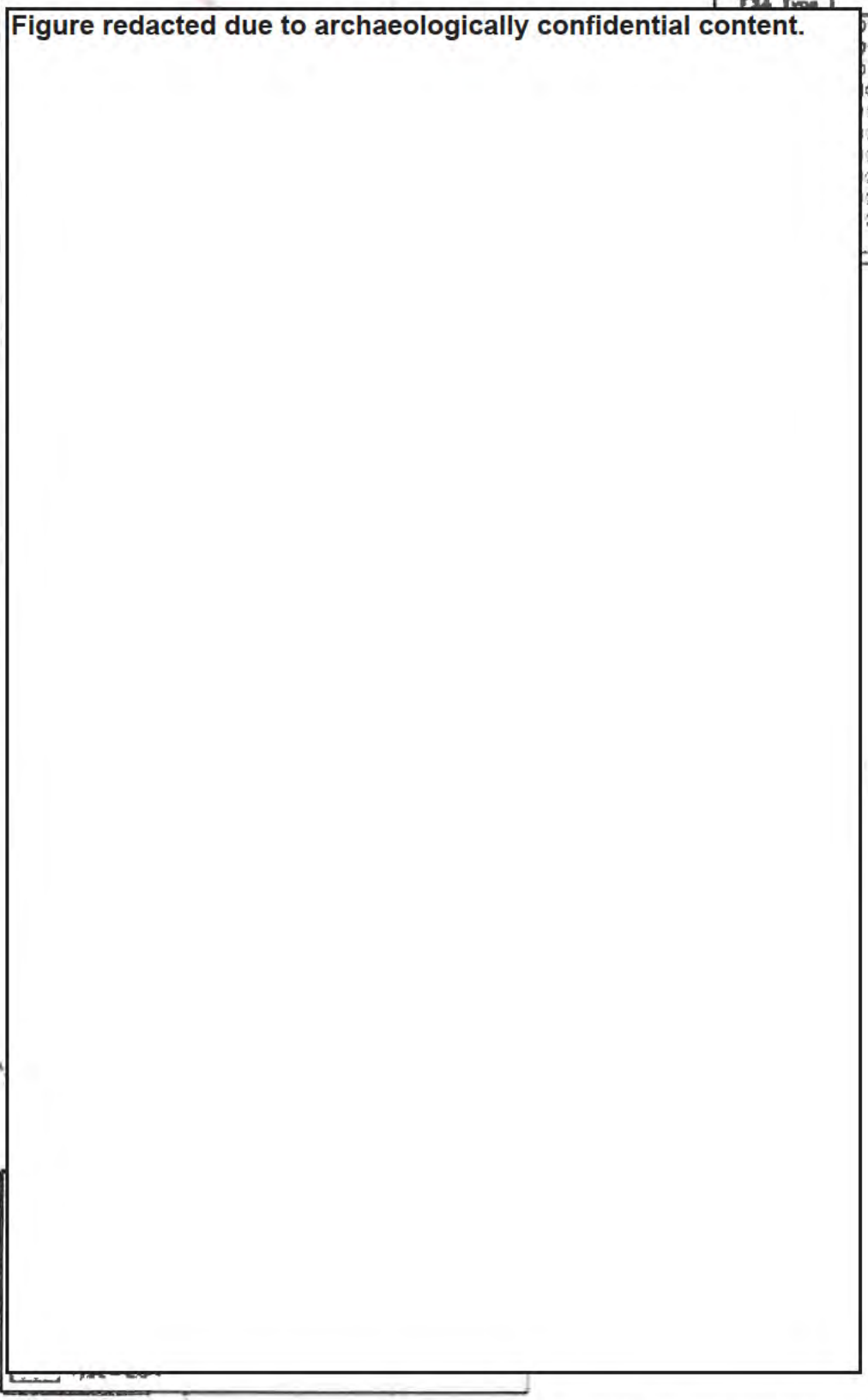
9/15/2020

MR #

CONFIDENTIAL

CITY OF ARCATA
OLD ARCATA ROAD IMPROVEMENTS
AREA OF POTENTIAL EFFECT
P-12-000365

FIGURE 10



FSA_Type	APN
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	50017206
	50018101
	50018102
	50018103
	50018104
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	50103119
	50103120
	50103123
	50103124
	50103129
	50103131
	50103137
	50103138
	50103141
	50103142
	50104204
	50104205

DZC

Old Arcata Road Improvement Project
Cultural Resources Existing Conditions
Redwood Community Action Agency
DZC PN# 2016-09

N

Arcata South
USGS 7.5 Minute Map
T.5 N., R.1 E.; Sec.33.
T.6 N., R.1 E., Sec.4

1:10,000
0 500 1,000
Feet

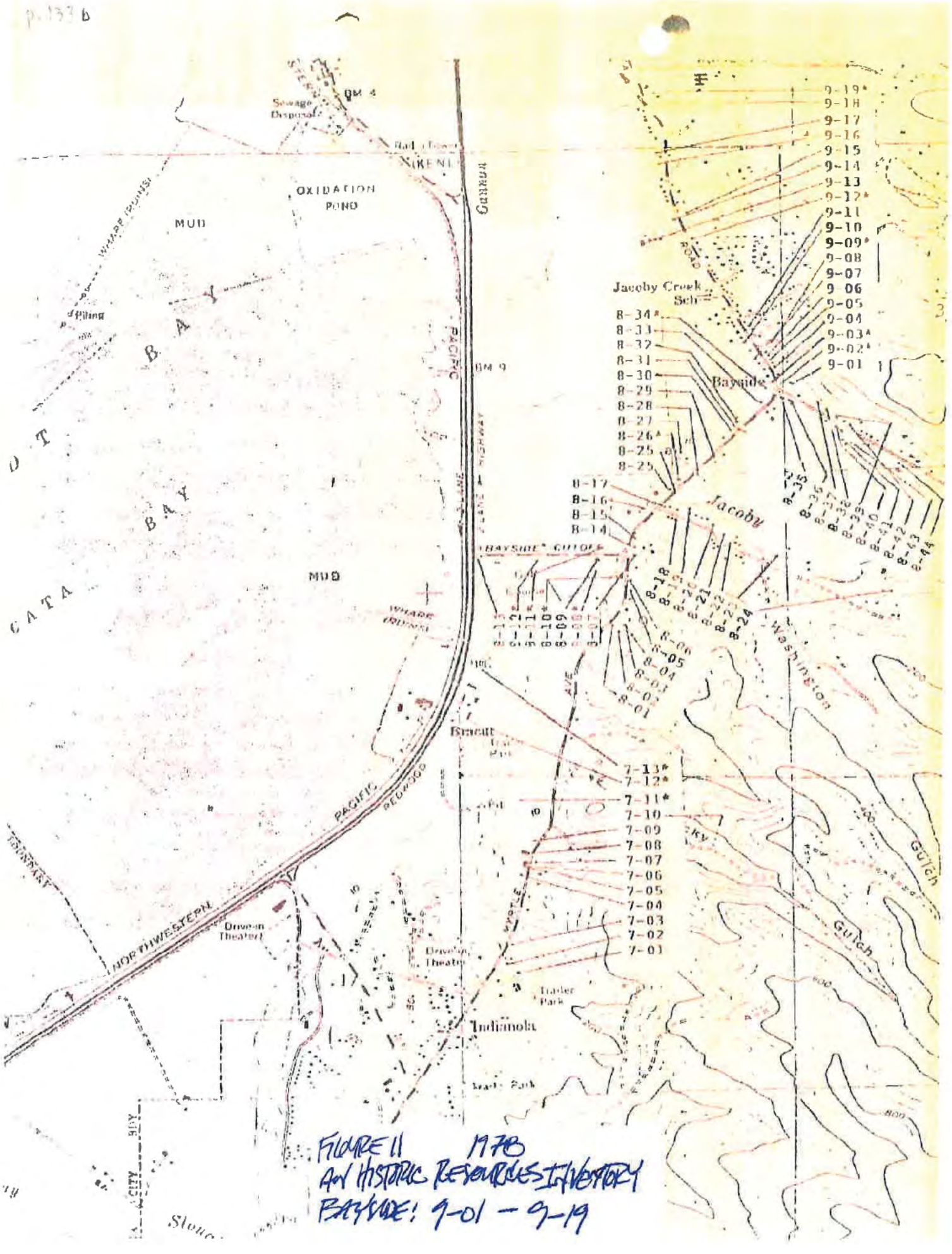


FIGURE 11 1978
AHI HISTORIC RESOURCES INVENTORY
BAYSIDE: 9-01 – 9-19

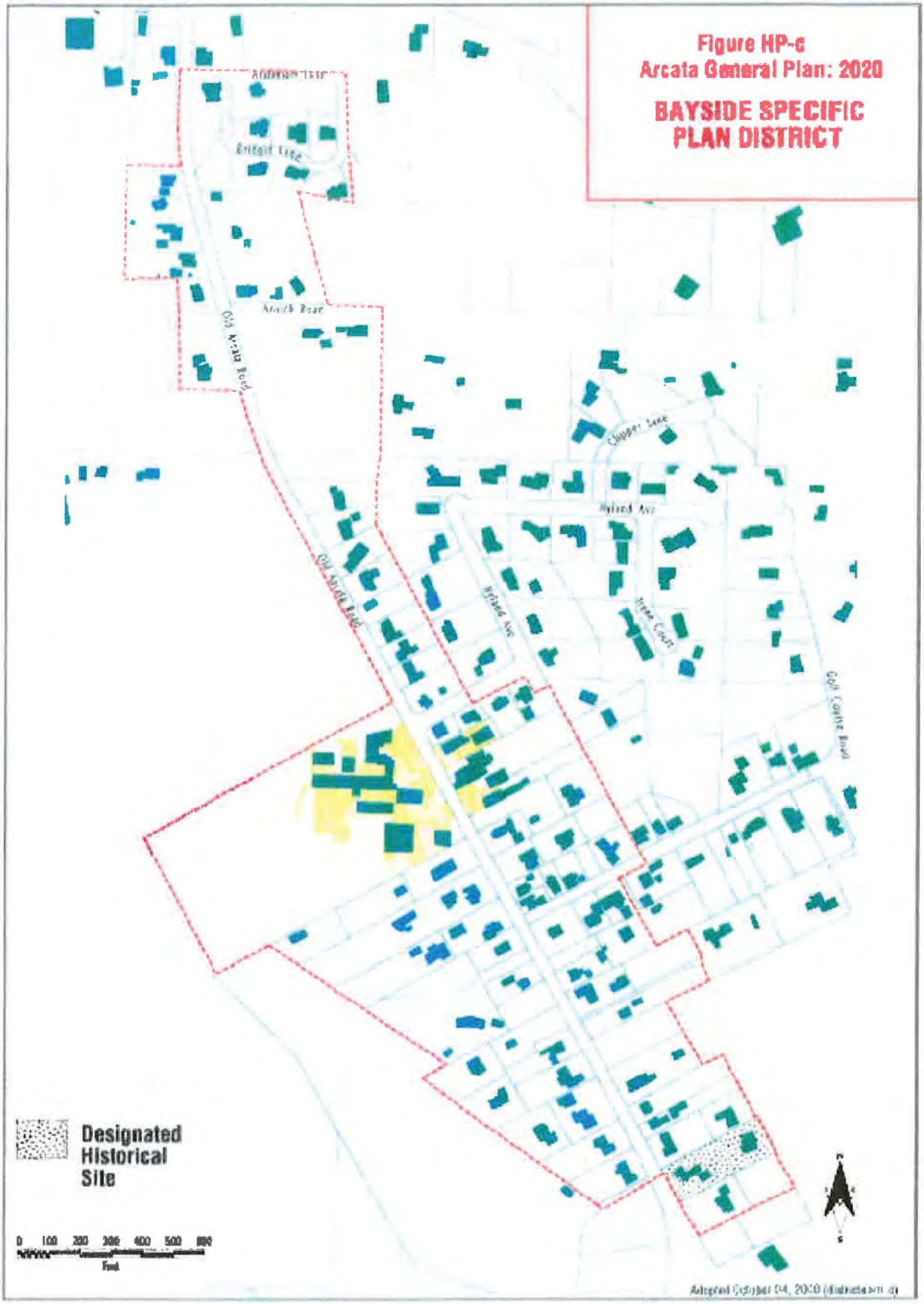


Figure HP-c
Arcata General Plan: 2020
BAYSIDE SPECIFIC PLAN DISTRICT
Designated Historical Site
0 100 200 300 400 500 800
Feet

FIGURE 12

STATE OF CALIFORNIA—THE RESOURCES AGENCY EDMUND G. BROWN JR., Governor

DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 2390
SACRAMENTO 95811
(916) 445-8006

November 3, 1978

Mr. Omar L. Homme
Federal Highway Administration
P.O. Box 1915
Sacramento, CA 95809

Attention: Bob Cady

Dear Mr. Homme:

I have received your letter of October 6, 1978 regarding the proposed highway improvement project along Myrtle Avenue - Old Arcata Road between the Cities of Eureka and Arcata in Humboldt County.

Representatives from the Federal Highway Administration, Humboldt County, and the Office of Historic Preservation conducted an on-site inspection of the project area on October 18, 1978. The area of potential environmental impact has been redefined to include the roadway corridor and adjacent properties.

I have reviewed the Historic Resources Inventory prepared by Humboldt County Department of Public Works and recommend that the following structures are eligible for inclusion on the National Register as architecturally important properties representing distinctive characteristics of a type, period, or method of construction:

3-04	Long-Graham Dairy Barn
5-05	Long-Graham House
5-06	Graham-Anderson House
5-07	George Graham House
5-10	Stephen Wilson House
5-11	Second Clifton Wilson House
5-12	Clifton Wilson Watertower
5-13	Kirkham-Chandler-Spaght House
5-14	Joseph Spinney House
6-02	Gideon Spinney House
6-03	John Pinkerton House
7-02	Viale House
7-03	Al & Mary Johnson House
7-06	George Pinkerton-McAlister Barn
7-08	George Pinkerton-Montgomery-Williamson Barn

7-09	George Pinkerton-Montgomery-Williamson House
8-05	Francis Henry House
8-06	James Henry House
8-07	Berry House
8-14	Noble House
8-16	Clendenin House
8-17	Dolbeer & Carson School/Matheson House
8-25	Campbell-Smith-Monroe House
8-28	McGuire Barn
8-30	McAdam-Barwise-Will McFarland House-Second Bayside Post Office
8-31	George Mitchell House
8-32	Bayside Presbyterian Church
8-33	Connors-Lawlor-Wilson House
9-04	Charles Monahan-Dexter House-Fifth & present Bayside Post Office
9-05	J. Venning Nellist-William Zucar-Amy Smith House
9-11	David Oscar-Nellist House
9-14	Rhodes-Marsh-Trinidad Watertower

Please feel free to contact Eugene Itogawa of my staff if you need any further assistance by calling (916) 322-8701.

Sincerely yours,

Knox Mellon

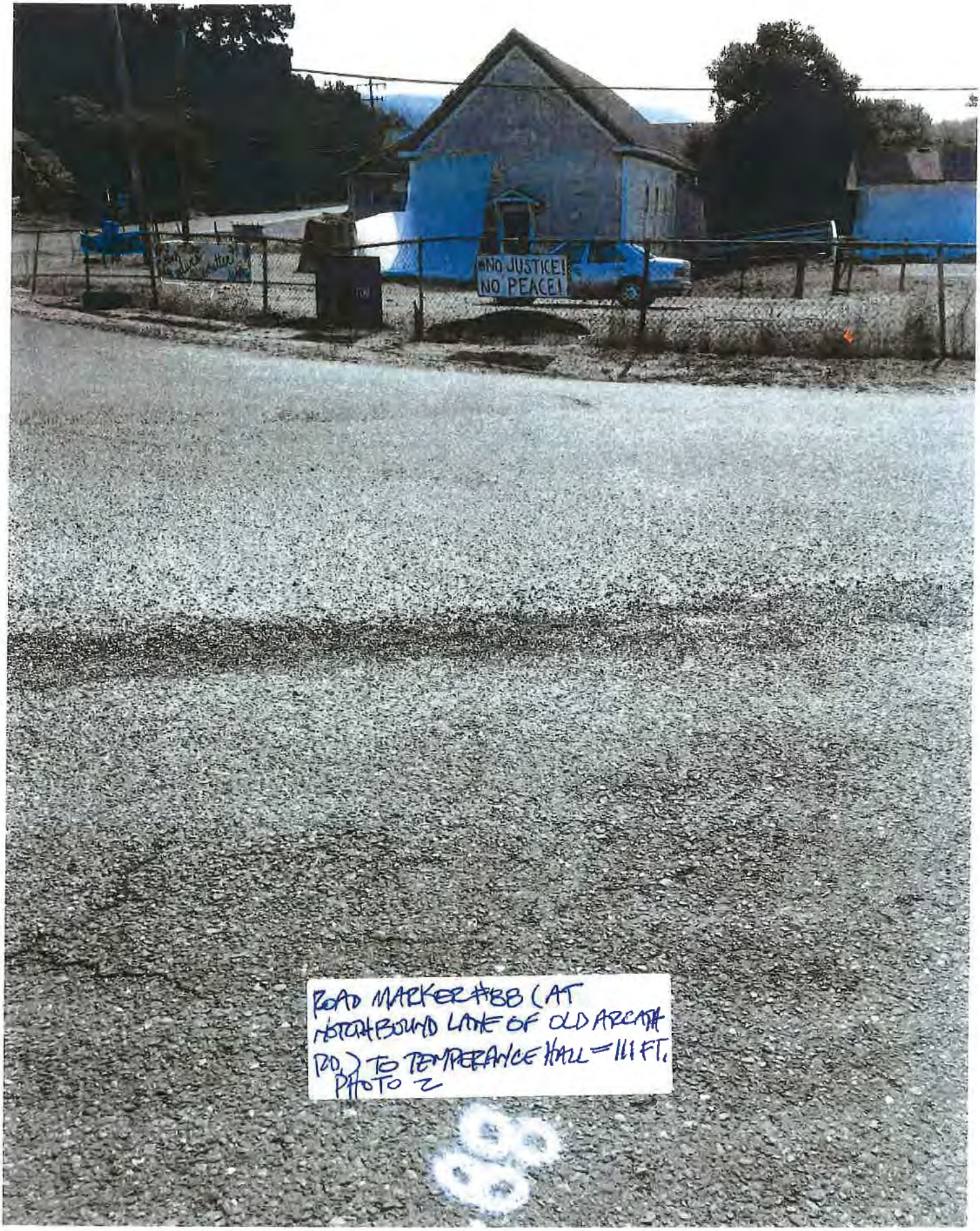
Dr. Knox Mellon
State Historic Preservation Officer
Office of Historic Preservation

GI:pbp

cc: Donald Tuttle
Natural Resources Analyst
County of Humboldt
1106 Second Street
Eureka, CA 95501

Louis S. Wall
Advisory Council on Historic Preservation
Box 25085
Denver, CO 80225

SHUSTER 1947 AERIAL
BAYSIDE CORNERS
PHOTO 1



ROAD MARKER #88 (AT NORTHBOUND LANE OF OLD ARCADIA RD.) TO TEMPERANCE HALL = 111 FT.
PHOTO 2

CARS IN ROUNDABOUT
ROAD WAY 45'
(PHOTO 4)
FROM TEMPERANCE HALL,
OLD GRANGE IN BACKGROUND

COUNTY LAND USED FOR COMMUNITY PARKING NEEDED FOR ROUNDABOUT. CITY REQUIRES ENCROACHMENT PERMIT FROM COUNTY. PHOTO 3


CARS IN ROUNDABOUT ROADWAY
45' FROM TEMPERANCE HALL
(103 OLD SCHOOL IN BACKGROUND)
PHOTO 5

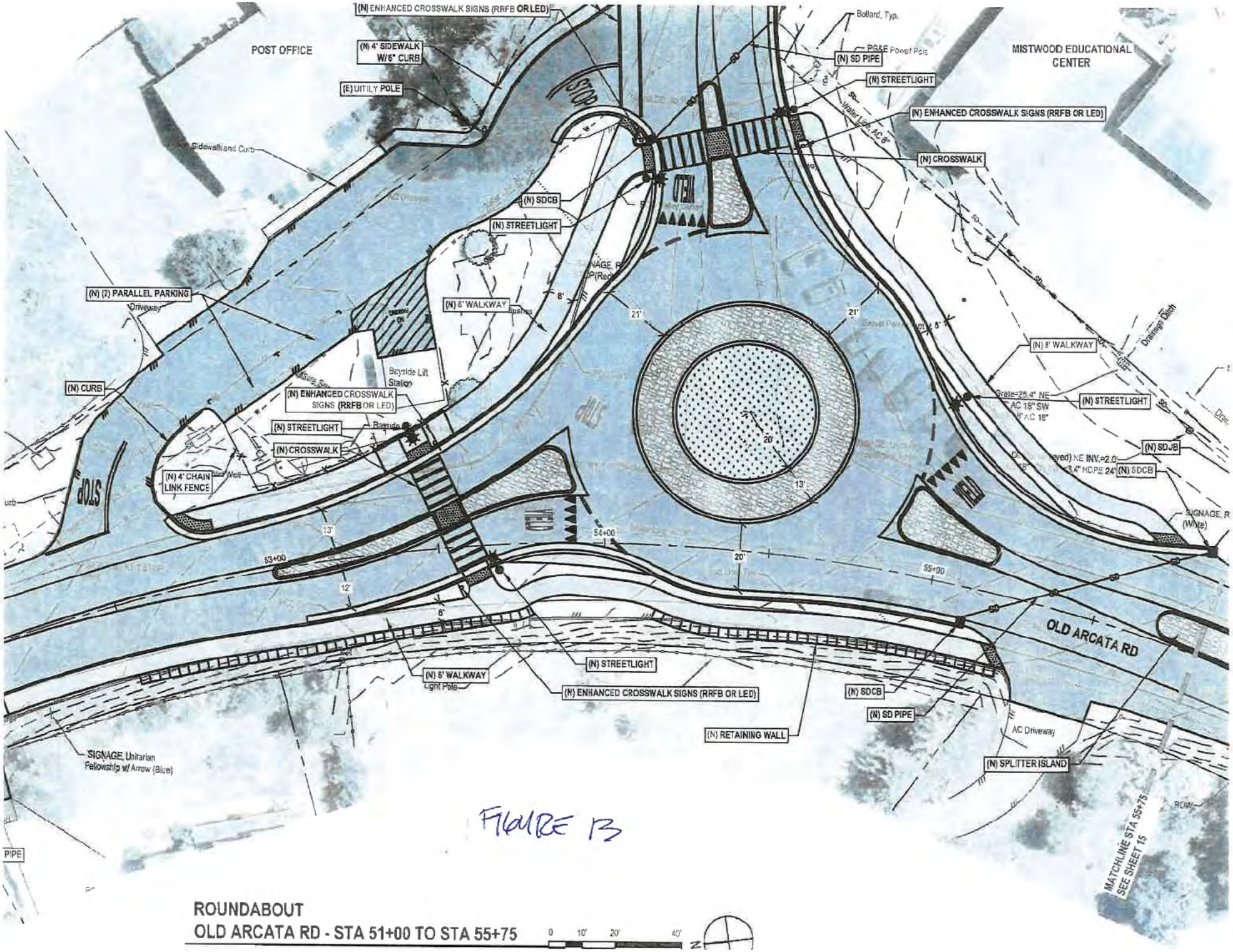


FIGURE 13

ROUNDABOUT
OLD ARCATA RD - STA 51+00 TO STA 55+75

0 10' 20' 40'

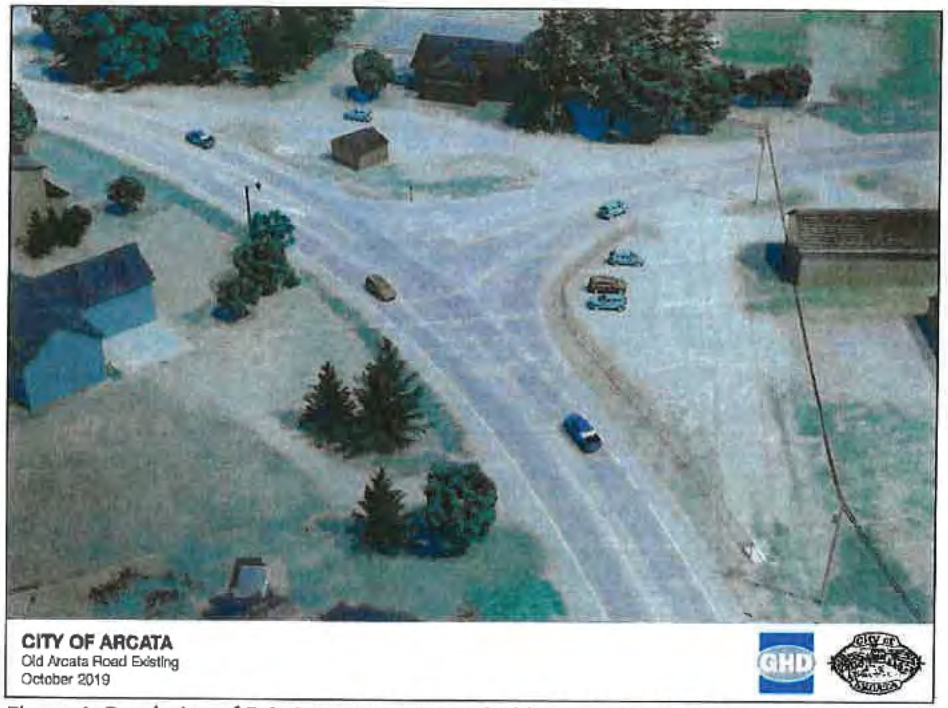


Figure 1: Rendering of Existing Intersection of Old Arcata Road and Jacoby Creek Road. Mistwood Education Center is on the right side of this image. No other known or potential historical resources are depicted.

Figure 2: Rendering of the Proposed Roundabout at the Intersection of Old Arcata Road and Jacoby Creek Road

FIGURE 14

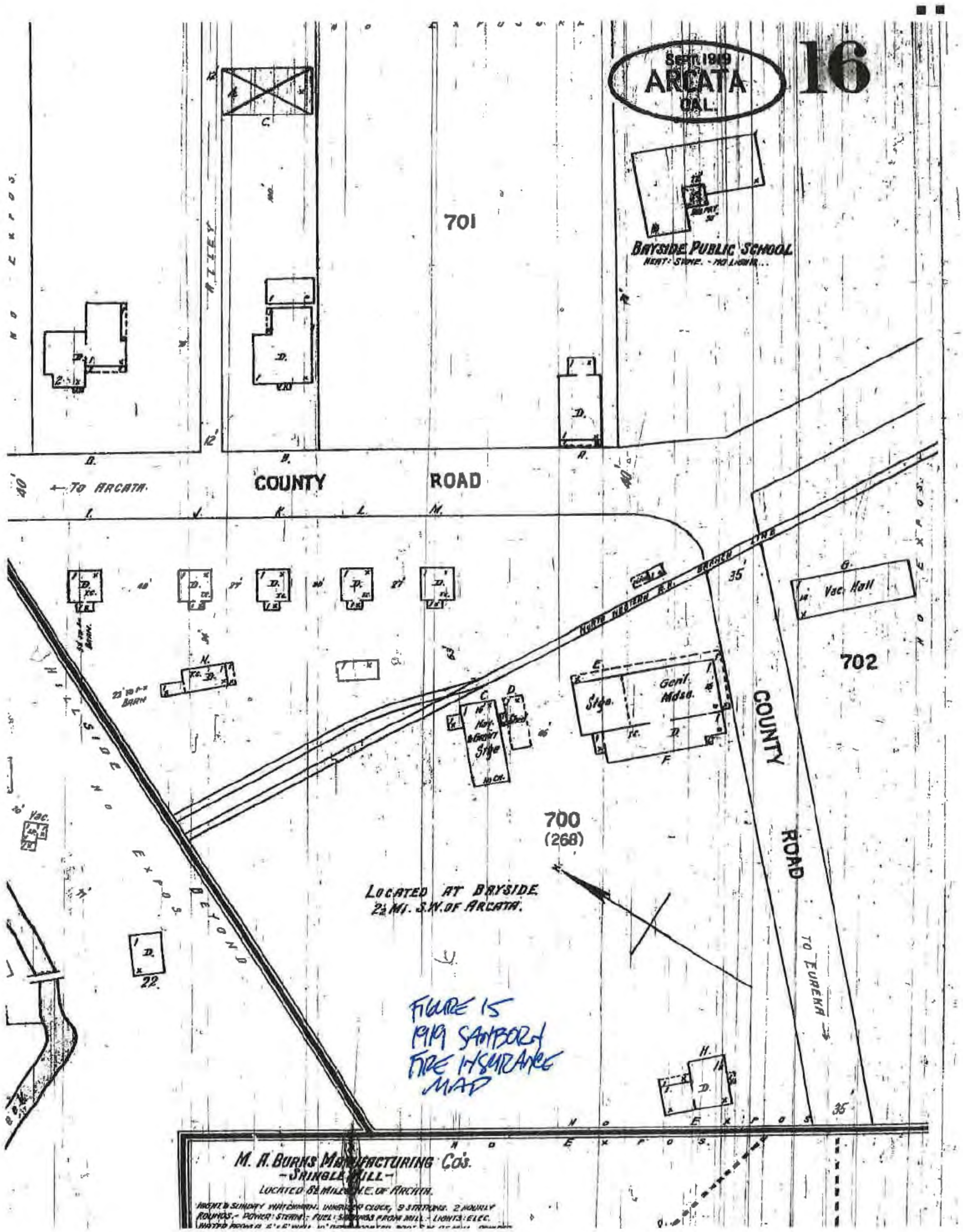


FIGURE 15
1919 SANBORN FIRE INSURANCE MAP

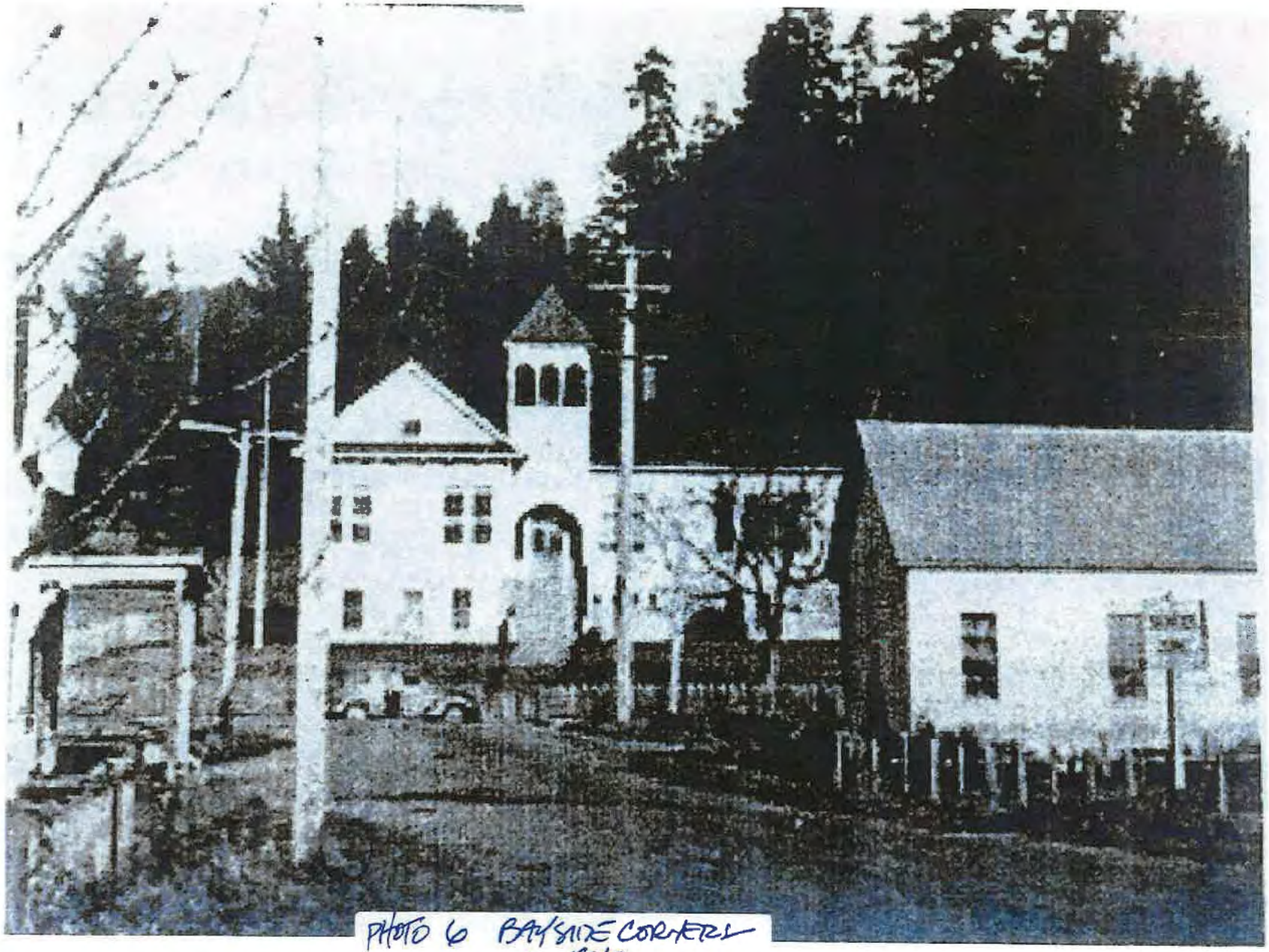


PHOTO 6 BAYSIDE CORNERS
C. 1940
LTOR: OLD STORE
OLD SCHOOL
TEMPERANCE HALL

PHOTO 7 BAYSIDE CORNERS
GOOGLE EARTH AERIAL PHOTO

PHOTO. 1887 BAYSIDE STORE
DEMOLISHED 1917 BY COUNTY
FOR ROAD PROJECT.

PHOTO 9 BAYSIDE STORE
WILSON FAMILY, OWNERS

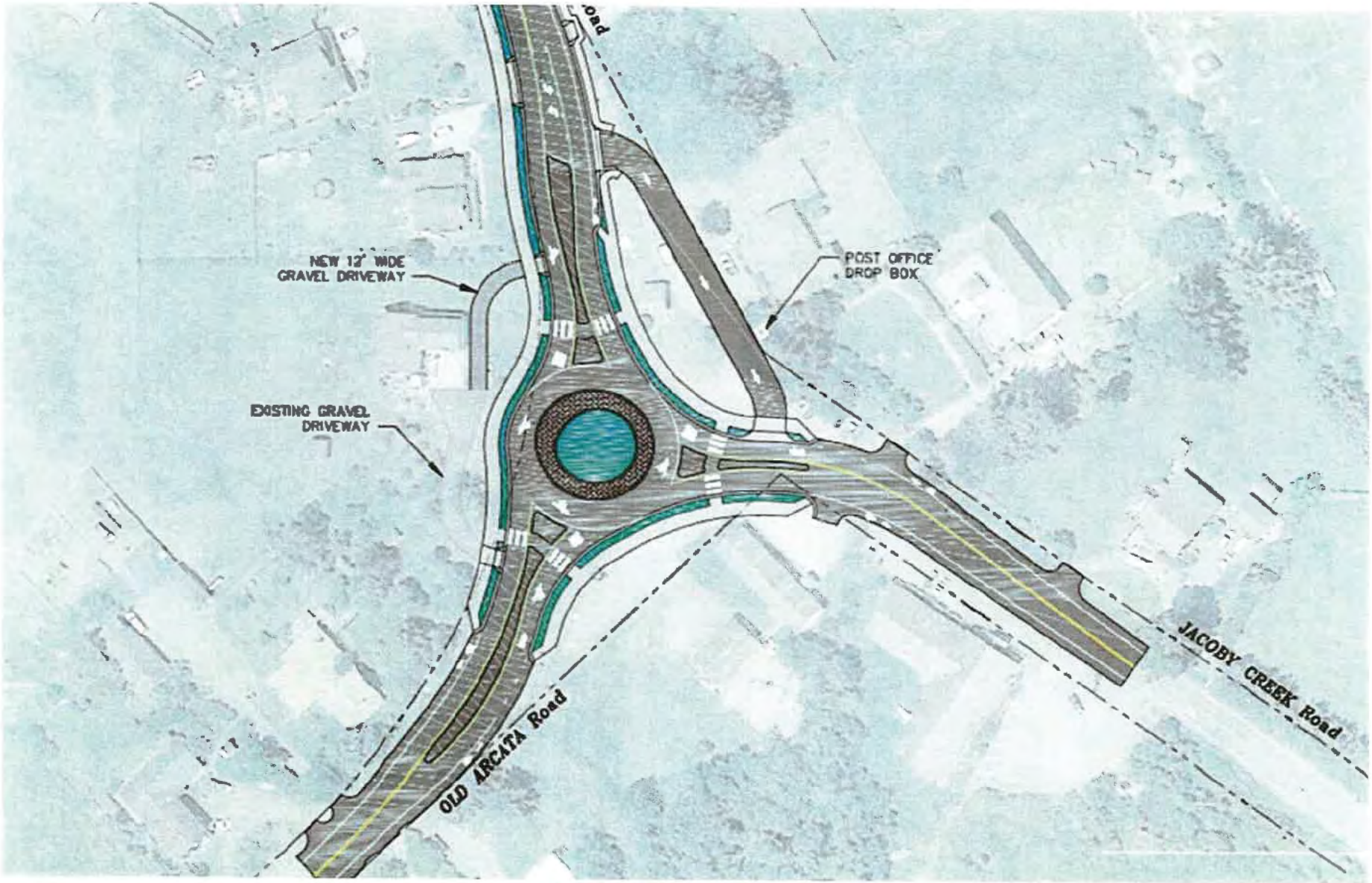


FIGURE 16
PROPOSED ROUNDABOUT AT
HISTORIC BAYSIDE CORNERS

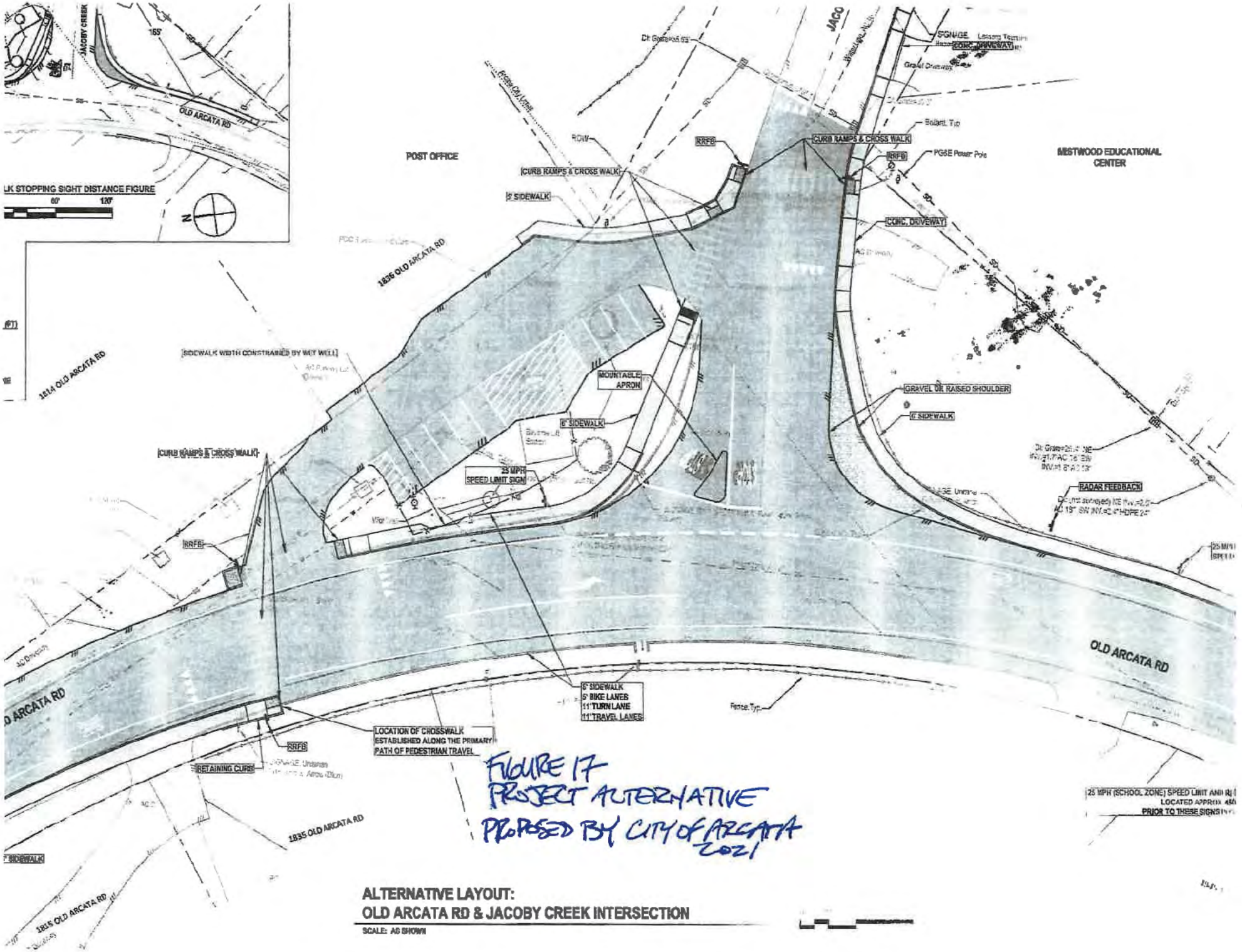


FIGURE 17
PROJECT ALTERNATIVE
PROPOSED BY CITY OF ARCATA
2021

ALTERNATIVE LAYOUT:
OLD ARCATA RD & JACOBY CREEK INTERSECTION

SCALE: AS SHOWN

Kathleen J. Stanton, M.A.

Curriculum Vitae

[redacted]

[redacted]

Summary

Worked professionally as a Historic Resources Consultant for over forty years, primarily in Humboldt County, but also in Sonoma and Mendocino Counties. Worked for over twenty years as a Real Estate Appraiser and seven years as a realtor in Humboldt County.

Education

Master of Arts in History, 1986
Sonoma State University, Rohnert Park, California

Bachelor Of Arts in Environmental Studies and Planning, 1980
Sonoma State University, Rohnert Park, California
Major: Urban Studies and Conservation
Minor: Historic Preservation

Licenses

Real Estate Appraiser License #AR 034999
Certified Residential
Bureau of Real Estate Appraisers, Sacramento, CA

Real Estate Salesperson License #01882689
Bureau of Real Estate, Sacramento, CA
Premier Realty and Associates, San Diego, CA

Professional Experience

Worked as an employee, contractor or subcontractor on historic projects for Eureka Heritage Society, Clark Memorial Museum, Humboldt County Historical Society, Humboldt Area Foundation, City of Eureka, City of Arcata, City of Ferndale, City of Willits, Humboldt County, Sonoma County, California Park Service, U.S. Forest Service, Redwood National Park & the Bureau of Land Management.

History Instructor, College of the Redwoods, 1998

Historic Resources Consultant, 1980 to present.
Successfully nominated: Old Town Eureka Historic District in 1991; Main Street Ferndale Historic District in 1993; Willits Carnegie Library in 1992, "Orange Lawn", Sonoma in 2008 and the Sweasey Theater/Arkley Center for The Performing Arts, Eureka to the National Register of Historic Places. Benbow Inn, Humboldt County, Point of Historical Interest, 1991. Nine

Landmark designations for the City of Arcata, 1988 -2001. Thirty-four Historic Resources Surveys & Studies, 1979 - 2006. Local Legacies Oral History Project 1998 - 2002, collaboration with six local high schools and the Library of Congress. Worked on numerous historic and prehistoric archaeological excavations in Sonoma, San Jose, Sacramento, Fort Humboldt, Eldorado National Forest, Tahoe National Forest & Mendocino County 1980 - 1987.

Awards

1995 - Preservationist of the Year, Eureka Heritage Society
2005 - Preservation Advocate, Historic Sites Society, Arcata
2007 - Educator of the Year, Historic Sites Society, Arcata

Grants

$52,000 Historic Preservation Fund Grant, Office of Historic Preservation, 1989
$2000 Preservation Services Fund Grant, National Trust for Historic Preservation, 1991
$1750 Historic Preservation Fund Grant, Office of Historic Preservation, 1991
$7000 McLean Foundation & Humboldt Area Foundation Grants, 2000

Papers

Historical Overview of the Hoopa Indian Reservation. 1986 thesis, History Dept., SSU
King Range Cultural Resource Management Plan. 1983. Bureau of Land Management
An Architectural Study of the Fur Barn at Fort Ross. 1981. CA Dept. of Parks & Recreation

Community Service

Chairperson, Historic Landmarks Committee, City of Arcata, 2010 - 2012
Secretary & Membership Manager, Humboldt County Historical Society, 1987
Special Projects Docent, Clarke Memorial Museum, Eureka, 1986 - 1990
Board Member, Eureka Heritage Society, 1988 - 1991

Professional Affiliations

National Trust for Historic Preservation
Eureka Heritage Society
Humboldt County Historical Society
North Coast Appraisers Association
Humboldt Association of Realtors

References

[redacted]

Letter 46 – Response to Comments

Response to Comment 46-1

Fundamental objectives of CEQA not achieved and environmental analysis fundamentally flawed

This comment is introductory and provides an overview of alleged deficiencies of the DEIR, including failure to analyze the whole of the project and sweeping difficult issues under the rug, which in turn results in fundamentally flawed environmental analysis. Responses to specific comments follow. No further response to Comment 46-1 is provided, as detailed responses to specific comments are provided below. These detailed responses show the City did indeed analyze the whole of the project, fully disclosed all potential environmental impacts as required under CEQA, and satisfactorily completed environmental analysis under the 2021 CEQA guidelines.

Response to Comment 46-2

Piecemeal environmental review

Comment 46-2 asserts the DEIR is deficient as a piecemeal environmental review and failed to consider necessary improvements to ten specific issues. The City has provided responses to the ten specific issues addressed below. Given all ten issues were addressed in the DEIR, the City does not agree that the environmental review was piecemeal as alleged.

1. **Failure to address the existing storm drain issues** – The comment asserts the Project fails to address existing storm drain issues and speculates there is a strong probability that the storm drain will back up. This speculation is not supported by facts or expert opinion. Contrarily, the City's DEIR analysis regarding stormwater and related runoff were evaluated by the Project's licensed Professional Engineer, who developed a specific mitigation measure to ensure the Project does not cause or exacerbate flooding. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion, Master Response 5 regarding drainage, and Master Response 9 regarding standards of adequacy of an EIR, citing Section 15151 of the CEQA guidelines. Please also see DEIR Section 3.9 (Hydrology and Water Quality), Impact HWQ-a and Impact HWQ-c (page 3.9-10 and page 3.9-11 through page 3.9-12), which explains that the Project would improve drainage near the roundabout. The Project would help to remedy the noted drainage issues near the roundabout. Please see the Errata in Final EIR Section 4 for additional details regarding storm drainage.

2. **Failure to describe sewer upgrades –** The comment cites concern over "potentially substantial adverse effects of the Project on the provision of sewer service to the properties in the APE" and expresses concern about the specificity of where the improvements will be made. Providing more reliable sewer service by replacing failed or failing laterals would have positive environmental impacts as described in the DEIR. The DEIR evaluated the potential environmental impact of replacing laterals that may be failing. To attain the degree of specificity requested in the comment, the City would have had to excavate every lateral to identify those that are failing. Per CEQA Guidelines Section 15151, the environmental analysis need not be exhaustive. Rather, it must be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision. The DEIR provided a level of detail that was reasonably attainable and feasible consistent with Section 15151. See Response 9 regarding standards of adequacy of an EIR.

   As described in Section 2.5.9 of the DEIR (page 2-6), the Project would include sanitary sewer, storm drain, sanitary sewer, and water infrastructure improvements. Specifically, *existing sanitary sewer laterals may be replaced with new cleanouts placed at the edge of the right of way. Depth of*

excavation/trenching for sewer lateral replaced would be approximately three feet (six feet max). These upgrades would occur to aging sewer utility infrastructure as a measure of standard maintenance. The risk of failure of the existing infrastructure increases with age. Given that construction and ground disturbance would already be occurring at and directly alongside subsurface sewer laterals in order to construct and upgrade storm drains and other elements of the described Project, it is efficient and the least environmentally damaging alternative for the City to concurrently upgrade the sewer laterals on an as-needed basis. This would eliminate the impact, cost, and need for two separate ground disturbing events in the same location and thus an increased potential for cumulative impacts. This would also eliminate the need to rip up the new pavement in the future, following completion of the Project. Upgrades to the existing sewer laterals and cleanouts would be determined based on the condition of the utility and available funding at the time of Project bidding and construction. Any potential service interruptions will be short in duration, in the magnitude of hours and no more than one work day. The City will outreach to affected customers in advance to provide notification and provide service alternatives as needed.

There is no evidence suggesting that the sewer lateral work will have any impact separate from and not already disclosed in the DEIR based on the overall Project. None of the referral agencies cited focused concern on lateral replacement, and none of the special studies conducted identified an impact of particular concern. The comment does not provide substantial evidence based on facts, reasonable assumptions predicated upon facts, or expert opinion supported by facts (CEQA Guidelines Sec. 15064(f)(5)). Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. Information provided in the DEIR pertaining to sewer upgrades conforms with Section 15146 of the CEQA Guidelines, CEQA Guidelines - Degree of Specificity: t*he degree of specificity required in an EIR will correspond to the degree of specificity involved in the underlying activity which is described in the EIR.* The comment does not identify an environmental impact that was not fully addressed in the DEIR. Amendment or additional clarification is not warranted.

3. **Failure to describe water utility upgrades** – The comment cites concern over "potentially substantial adverse effects" of the Project related to water utility upgrades. Providing more reliable water service by replacing failed or failing water service connections would have positive environmental impacts as described in the DEIR. The DEIR evaluated the environmental impact of replacing water service connections (resetting or installing water meters within the public right of way) that may be failing. To attain the degree of specificity requested in the comment, the City would have had to excavate every water meter and water connection to identify those that are failing. Per CEQA Guidelines Section 15151, the environmental analysis need not be exhaustive. Rather, it must be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision. The DEIR provided a level of detail that was reasonably attainable and feasible consistent with Section 15151. See Response 9 regarding standards of adequacy of an EIR.

   As described in Section 2.5.9 of the DEIR (page 2-6), the Project would include storm drain, sanitary sewer, and water infrastructure improvements. Specifically, *water service connections may be updated, along with resetting and/or installation of water meters within City/Public right of way.* These upgrades would occur to aging water utility infrastructure as a measure of standard maintenance The risk of failure of the existing infrastructure increases with age. Given construction and ground disturbance would already be occurring at and directly alongside subsurface water infrastructure in order to construct and upgrade storm drains and other elements of the described Project, it is efficient and the least environmentally damaging alternative for the City to concurrently upgrade the water utility

infrastructure in the same location on an as-needed basis. This would eliminate the impact, cost, and need for two separate ground disturbing events in the same location and thus an increased potential for cumulative impacts. This would also eliminate the need to rip up the new pavement in the future, following completion of the Project. Upgrades to the existing water utility infrastructure would be determined based on the condition of the utility and available funding at the time of Project bidding and construction and would be limited. Service extensions would not occur. Service laterals and water meters would be replaced, as described in section 2.5.9 of the DEIR (page-26). Any potential service interruptions will be short in duration, in the magnitude of hours and no more than one work day. The City will outreach to affected customers in advance to provide notification and provide service alternatives as needed.

There is no evidence that the water utility upgrades will have any impact separate from and not already disclosed in the DEIR based on the overall Project. None of the referral agencies cited focused concern on water utility upgrades, and none of the special studies conducted identified an impact of particular concern. The comment does not provide substantial evidence based on facts, reasonable assumptions predicated upon facts, or expert opinion supported by facts (CEQA Guidelines Sec. 15064(f)(5)). Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. Information provided in the DEIR pertaining to water utility upgrades conforms with Section 15146 of the CEQA Guidelines, CEQA Guidelines - Degree of Specificity: t*he degree of specificity required in an EIR will correspond to the degree of specificity involved in the underlying activity which is described in the EIR.* The comment does not identify an environmental impact that was not fully addressed in the DEIR. Amendment or additional clarification is not warranted.

4. **Failure to describe elimination of an undisclosed number of parking spaces** – The commenter suggests the EIR fails to disclose details related to elimination of parking and replacement parking. Discussion of parking was included on page 5 of Appendix E of the DEIR (Final IS/MND, Response to Comments, and Errata) as Master Response 2 – Parking. This Master Response has been reiterated within this Final EIR as Master Response 3. Parking is also discussed on page 164 of Appendix E, under Response to Comments 37-1 and 370-2. Per CEQA Guidelines Sec. 15151, the environmental analysis need not be exhaustive. Rather, it must be prepared with a sufficient degree of analysis to provide decision makers with information that enables them to make a decision. The DEIR provided detail that was reasonably feasible consistent with Sec. 15151. See Response 9 regarding standards of adequacy of an EIR. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, clarifications, or additional mitigations are warranted to address environmental impacts. The City Council may consider parking in their project approval.

5. **Failure to describe bicycle and pedestrian connectivity beyond the APE** – The commenter states the EIR fails to describe what provisions will be made for bicycle and pedestrian connectivity beyond the APE (Project Area). The physical footprint of the Project is bounded by the APE. Existing bicycle and pedestrian connectivity beyond the APE is not an issue under CEQA, and the conditions of existing bicycle and pedestrian connectivity outside of the APE is not considered an environmental effect of a proposed project. This comment was specifically addressed in Appendix E of the DEIR (Final IS/MND, Response to Comments, and Errata) on page 138 under Comment 34-6. Eventually, all sidewalks must end. In this case, the sidewalks at the southern end of the Project boundary along Old Arcata Road and Jacoby Creek Road will transition onto the striped shoulder of each respective roadway, consistent with applicable design safety guidelines as detailed on page 2-3 and 2-4 of the DEIR in Section 2 (Project

Description). The commenter asks the question about provision of bicycle and pedestrian facilities beyond the Project boundary, but does not focus on the sufficiency of the document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects of the Project may be mitigated or avoided (CEQA Guidelines Sec. 15204(a)). No amendments, clarifications, or additional mitigations are warranted.

6. **Failure to create wetlands for mitigation purposes** – The comment regards compensatory mitigation required for wetland fill. Please see Master Response 8 regarding impacts to wetlands. Wetland impacts will not occur as a result of the Project. No further analysis is necessary and no revisions to the EIR are required to be made.

7. **Failure to describe protection measures to protect sight and hearing impaired children at crosswalks near the roundabout** – The comment regards safety measures for sight and hearing impaired individuals using crosswalks near the roundabout. Under existing conditions, there are not any crosswalks at the intersection of Old Arcata Road and Jacoby Creek Road, and community members are forced to cross the roadway absent any pedestrian facilities for anyone, including the hearing and sight impaired. The Project proposed to integrate two new crosswalks into the intersection to facilitate pedestrian safety and improve the overall walkability of the community. The Project would be designed consistent with applicable design safety guidelines as detailed on page 2-3 and 2-4 of the DEIR in Section 2 (Project Description), which include Americans with Disabilities Act (ADA) guidelines, including required provisions for sight and hearing impaired children at crosswalks. Within the circulatory portion of the roundabout, a landscape buffer will be provided to help direct users who are visually impaired to the crosswalks. As indicated in Section 2.4.5 of the Project Description (page 2-4), all crosswalks across Old Arcata Road and Jacoby Creek Road are proposed to include user activated warning lights (e.g., LED enhanced signs or rectangular rapid-flashing beacons [RRFB]). The push buttons for the warning lights will be ADA compliant and will include visual and audible activation confirmation. The curb ramps at the crosswalks would also include detectable warning surfaces (Image 1). Detectable warnings are a distinctive surface pattern of domes detectable by cane or underfoot that alert people with vision impairments of their approach to street crossings and hazardous drop-offs. The detecting warning surfaces have also been added to the Errata in Final EIR Section 4 and the full 30% design set has been added as Appendix C of the FEIR. The 30% design set also remains available on the City's Project-dedicate website, where it was posted during circulation of the DEIR, https://www.cityofarcata.org/720/Old-Arcata-Road-Design-Project. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

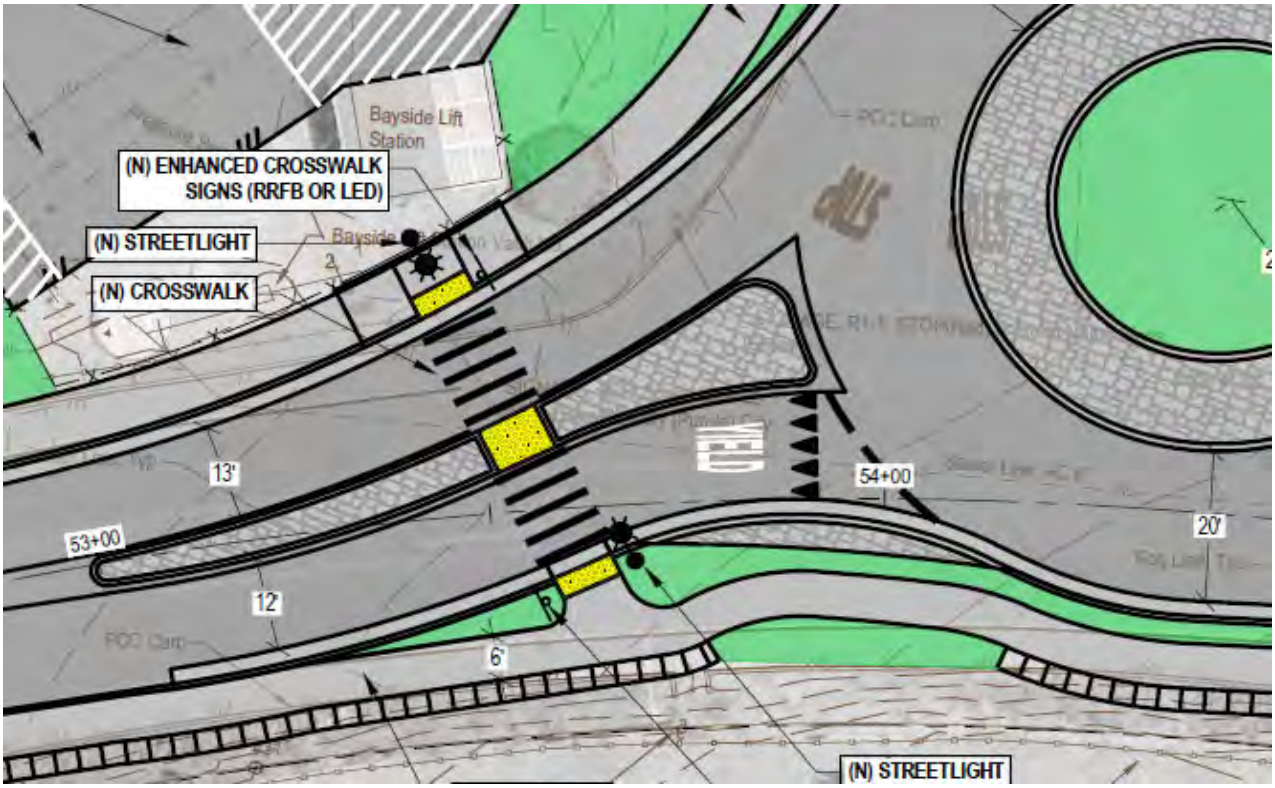


Image 1. Excerpt of the 30% design planset (sheet 16, roundabout) showing the enhanced crosswalk sign and detectable warning surfaces, shown in yellow.

8. **Wetland mitigation** – Please see Master Response 8 regarding impacts to wetlands. Wetland impacts would not occur as a result of the Project.

9. **Increases in roadbed elevation related to drainage and access to properties** – The comment seeks to clarify the final roadbed elevation as it related to drainage and property access. As noted in the Project's 30% designs, the pavement overlay will be three to six inches thick. This detail has been added to the Errata in Final EIR Section 4. The full 30% design set has been added as Appendix C of the FEIR The 30% design set also remains available on the City's Project-dedicate website, where it was posted during circulation of the DEIR, https://www.cityofarcata.org/720/Old-Arcata-Road-Design-Project. The comment asserts elevation changes in the roadbed could result in a potential adverse changes to drainage and property access. This speculation is not supported by facts or expert opinion. Contrarily, the City's DEIR analysis on drainage and related runoff evaluated by the Project's licensed Professional Engineer, who developed a specific mitigation measure to ensure the Project does not cause or exacerbate flooding. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion, Master Response 5 regarding drainage, and Master Response 9 regarding standards of adequacy of an EIR, citing Section 15151 of the CEQA guidelines.

   As noted in Section 2.5 of the Project Description (page 2-3), new pavement would extend into residential and commercial driveways along Old Arcata Road to ensure smooth transition between existing and new pavement elevations. The enhanced driveway conforms would maintain property access. Increasing the elevation of the roadbed by three to six inches would have no effect on the volume or timing of stormwater runoff (drainage), which is otherwise controlled by the impervious surface area and more substantial changes in topography and drainage. The surfaced roadway would be crowned and sloped to approximately 2% per to support drainage to the side of the roadway.

Throughout the Project Area, enhancements to the formal sub-surface storm drain network and pervious landscaped buffers would better convey and infiltrate stormwater runoff to improve drainage. See also Master Response 5 regarding Drainage.

The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

10. **Protective measures to ensure historic structures in or near the APE do not suffer damage from vibrations caused by construction or from vehicle impact with speed humps to be installed** – Please see Master Response 4 regarding noise and vibration impacts. Operational noise will decrease due to a quieter, smoother roadway surface and traffic calming measures. The Project would not create vibrations that could damage buildings. The comment is not supported by facts, expert opinion or any evidence of new environmental impacts or concerns that were not fully addressed in the DEIR. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. No amendments, additional clarifications, or additional mitigations are warranted.

Response to Comment 46-3

Inadequate project description.

Comment 46-3 asserts the Project Description is inadequate. The City has provided responses to the specific issues addressed below. These issues were addressed in the DEIR or are not germane to environmental impact analysis under the CEQA Appendix G Environmental Checklist. The project description was adequate and detailed enough to sufficiently identify and analyze the possible impacts on the environment and ways in which the significant effects of the Project may be mitigated or avoided (CEQA Guidelines Sec. 15204(a)).

1. **Details concerning storm drain improvements have not been provided** – The comment notes the DEIR fails to provide sufficient detail specific to storm drain improvements. Per CEQA Guidelines Section 15151, the environmental analysis need not be exhaustive. Rather, it must be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision. The DEIR provided a level of detail that was reasonably attainable and feasible consistent with Section 15151. Please see Master Response 9 regarding standards of adequacy of an EIR.

   Storm drain improvements are described in Section 2.5.9 of the Project Description (page 2-6). Additionally, as described in Section 2.3 under Goals and Objectives (page 2-2), one of the goals of the Project is to address the drainage-related concerns raised in this comment. The Project improves the subsurface storm drainage infrastructure to both relieve existing drainage issues and to ensure storm drainage attributable to the Project's design elements is appropriately conveyed. Where the existing storm drainage network is ad-hoc or insufficient to achieve these purposes, improvements have been proposed under the existing 30% design as described in the EIR. Specific improvements include:

   - A vegetated median along the majority of the Project alignment to support infiltration from both the roadway and the walkway (see Figure 2-2 through Figure 2-5 of the DEIR, shown in green);
   - New storm drain enhancements near Jacoby Creek School and the roundabout, which include sub-surface piping, inlets, and storm drain control boxes (see Figure 2-2 through Figure 2-5 of the DEIR, shown in light blue););

- Increased subsurface storage (e.g., larger pipes or parallel pipes) would be used to retain runoff and accommodate a potential increase in peak runoff resulting from the modest increase in impervious surface at the roundabout;
- If necessary, permeable pavement could be incorporated into the design in key locations (e.g., parking near the pumping station) to minimize new impervious surface and reduce surface runoff.

Please also see Section 3.9 (Hydrology and Water Quality), Impact HWQ-a and Impact HWQ-c (page 3.9-10 and page 3.9-11 through page 3.9-12), which explains the Project would improve drainage throughout the Project Area. Additionally, the Project incorporates recommendations from the required drainage study into the final design under Mitigation Measure HWQ-1 (page 3.9-10 and 3.9-11). As specified under Mitigation Measure HWQ-1, this includes a capacity analysis of the post-Project drainage facilities. The capacity analysis will ensure the proposed drainage has sufficient capacity to meet the Project's goals of improving drainage and to avoid any significant drainage capacity-related impacts.

2. **Conflicts with existing underground utilities –** The comment expresses concern regarding undisclosed or unanalyzed conflicts with existing underground utilities. As a matter of standard design practice, existing utility information, specifically, spatial data files, was sought from all public and private utility providers and overlaid in the Project Area to ensure utility conflicts do not occur. Based on the information provided, conflicts with the existing underground gas line have been identified. If unavoidable conflicts are identified during final design, the utility owner would be notified and would be required to relocate facilities. Please see Master Response 2 regarding substantial evidence. The assertion that the Project will interfere and conflict with existing underground utilities is not supported by any evidence. The comment notes the DEIR fails to provide sufficient detail specific to storm drain improvements. Per CEQA Guidelines Section 15151, the environmental analysis need not be exhaustive. Rather, it must be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision. The DEIR provided a level of detail that was reasonably attainable and feasible consistent with Section 15151. Please see Master Response 9 regarding standards of adequacy of an EIR. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

3. **Elimination of a large number of parking spaces –** Please see Response to Comment 46-2, Item 4 regarding the elimination of parking. See also Master Response 4 regarding parking.

4. **Failure to specify protective measures for the elderly, sight impaired, and/or hearing impaired** – Please see Response to Comment 46-2, Item 7 regarding crosswalk safety standards.

5. **Failure to specify the existing wetland will be filled** – Please see Master Response 8 regarding impacts to wetlands. Wetland impacts (fill) will not occur as a result of the Project.

6. **Failure to specify potential adverse effects to existing wetlands in and adjacent to the APE** – Please see Master Response 8 regarding impacts to wetlands.

7. **Failure to address bicycle safety in the roundabout, which has no bike lanes** – The commenter is raising the issue of bicycle safety within the roundabout.

Roundabout design guidance (NCHRP 672, FHWA 2010) suggests that *"in general, cyclist that have the knowledge and skills to ride effectively and safely on collector roadways can navigate low-speed, single-lane roundabouts with-out much difficulty. Cyclists and motorists will travel at approximately the same speed, making it easier for bicyclists to merge with other vehicular traffic and take the lane within the roundabout itself."* In addition, the flow and design of roundabouts result in reduced speed, heightened driver awareness, and reduced points of conflict, which all improve safety for bicyclists and pedestrians. Regarding bike lanes, roundabout design guidance (NCHRP 672) suggests that roundabouts not include bike lanes within the circulatory roadway of roundabouts as they would *"suggest that bicyclists should ride at the outer edge of the circulatory roadway, which can increase crashes resulting from exiting motorists who cut off circulating bicyclists and from entering motorists who fail to yield to circulating bicyclists."* Instead, bike lanes should be terminated prior to the roundabout to help remind cyclist that they need to merge into the travel lane. Cyclists who may not be comfortable traversing the roundabout in the vehicular lane can choose to exit roadway using bicycle ramps in advance of the roundabout traverse the intersection using the crosswalks and exterior sidewalks.

As a stated goal in Section 2.3 of the Project Description (page 2-2), the Project will increase multimodal transit use by improving bicycle and pedestrian facilities via shared use pathways, re-striped bicycle lanes, improved and extended sidewalks, and enhanced crosswalks. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

8. **Failure to address how residents can put out their trash cans for pick up without blocking bike lanes** – The commenter is raising the issue of conflicts between users and trash cans, which are often placed in the street weekly on pick up day. This issue was specifically addressed in Appendix E of the EIR (Final IS/MND, Response to Comments, and Errata), page 134 under Response to 33-1 – Garbage Service. *Trash and recycling service does impact vehicle lanes on occasion. Thus, users will need to exercise caution and remain attentive to obstacles in the roadway.* Additionally, this is not an environmental issue per the CEQA Appendix G Environmental Checklist. Please see Master Response 1 regarding issues unrelated to CEQA. No further response is required. Please also see Master Response 1 regarding issues unrelated to CEQA.

9. **Failure to address bicycle and pedestrian safety where power poles conflict with bike lanes and walkways –** The commenter is concerned about potential conflicts between the Project's design features (walkways/sidewalks) and existing power poles. This issue was also specifically addressed in Appendix E of the EIR (Final IS/MND, Response to Comments, and Errata), page 134 under Response to 33-2 – Relocation of PG&E Pole and Limit Project to Roadway Construction. *As the design progresses, the City will work with the utility companies to relocate the pole in question within the existing right of way if necessary.* Aside from the power pole in question near Golf Course Drive and Old Arcata Road, there are no additional power poles that would conflict with the Project's design feature. The impact analysis specific to the power pole in question and utility service expansion can be found in Section 3.13-5 (Utilities) of the DEIR on page 3.13-5. Additionally, this is not an environmental issue per the CEQA Appendix G Environmental Checklist. Please see Master Response 1 regarding issues unrelated to CEQA. No further response is required.

10. **Failure to specify the elevation of the finished road grade and resulting effects on drainage and property access** – Please see Response to Comment 46-2, Item 9 regarding this issue, which was previously raised in the same comment letter.

Response to Comment 46-4

Potentially significant unmitigated traffic safety impacts.

Comment 46-4 asserts the Project results in unmitigated traffic safety impacts. The City has provided responses to the specific issues addressed below. The City does not agree that unmitigated traffic safety impacts would result from the Project. This speculation is not supported by facts or expert opinion. Contrarily, the City's Project design and DEIR analysis on transportation were evaluated by the Project's licensed Professional Engineer. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion, Master Response 5 regarding drainage, and Master Response 9 regarding standards of adequacy of an EIR, citing Section 15151 of the CEQA guidelines.

1. **Idling motor vehicles on the roadway due to lack of parking –** The commenter is concerned additional vehicle idling resulting from the Project could result in significant unmitigated traffic safety impacts. Please see Master Response 3 regarding parking. As stated in the DEIR under Section 3.11 (Transportation), Impact-TR-b, page 3.11-12, the Project would reduce vehicle miles traveled (VMT) by promoting multi-modal transportation. Thus, the Project will result in fewer vehicles in the Project Area, as individuals and families would be more able to safely walk or bicycle throughout the community of Bayside. A traffic safety impact from an alleged increase in idling motor vehicles would not occur as a result of the Project. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

2. **Illegally parked vehicles due to lack of parking –** The commenter is concerned additional illegally parked vehicles resulting from the Project could result in significant unmitigated traffic safety impacts. Legal parking is not an environmental issue per the CEQA Appendix G Environmental Checklist. Please see Master Response 1 regarding issues unrelated to CEQA. As noted above in Response to Comment 46-4, Item 1, the Project would reduce vehicle miles traveled by promoting multi-model transportation. Illegal parking would be in violation of City and County code. Violators would be subject to ticketing under each agency's respective parking code and enforcement policies. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

3. **Danger to pedestrians in the roundabout crosswalks due to lack of stop signs** – Please see Response to Comment 46-2, Item 7.

4. **Danger to bicyclists in the roundabout due to lack of bike lanes** – Please see Response to Comment 46-3, Item 7.

5. **Danger to bicyclists due to trash cans in bike lanes –** The commenter is concerned that conflicts with trash cans placed in the bicycle lanes could result in significant unmitigated traffic safety impacts. This is not an environmental issue per the CEQA Appendix G Environmental Checklist. Please see

Master Response 1 regarding issues unrelated to CEQA. Please see Response to Comment 46-3, Item 8. Garbage and recycling cans on the side of the road on pick up day does not constitute a hazard related to a geometric design feature or an incompatible use under Transportation Impact C of the CEQA Appendix G checklist. Weekly garbage collection is an existing condition and function that would continue following implementation of the Project. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

6. **Danger to bicycles and pedestrians due to power poles in the walkways and bike lanes -** Please see Response to Comment 46-3, Item 9. The City will not construct a bike lane or walkway that physically conflicts with an existing power pole. No further response is required.

Response to Comment 46-5

Impacts to Wetlands

The comment raises questions regarding the potential for impacts to wetlands. This speculation is not supported by facts or expert opinion. Contrarily, the City's technical biological documents pertaining to wetlands, as well as the DEIR analysis on regarding wetlands, were developed by the Project's qualified wetland scientists (CEQA Guidelines Sec. 15064(f)(5)). Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion and Master Response 9 regarding standards of adequacy of an EIR, citing Section 15151 of the CEQA guidelines. Please also see Master Response 8 regarding impacts to wetlands, explaining that wetlands would not be impacted (filled) as a result of the Project. Additionally, please see Section 3.3 (Biological Resources), Section 3.3.5 Methodology on page 3.3-23, which explains that the original wetland delineation included in Appendix D was updated in June 2021 (GHD 2021), with concurrence from the U.S. Army Corps of Engineers (USACE 2021). The wetland delineation included in Appendix D (Natural Environment Study) spanned the entire Project Area. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-6

This comment raises concerns about conflicts with both City of Arcata and Humboldt County General Plan policies and the Project, but does not specify which policies are in conflict. The vague assertion is not supported by facts. Contrarily, the City's technical documents and the DEIR analysis were developed by the Project's qualified scientists, environmental planners, and engineers (CEQA Guidelines Sec. 15064(f)(5)). Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. The DEIR addresses the land use consistency with both the City of Arcata and Humboldt County General Plans in each environmental impact section under the regulatory framework heading.

Land use impacts

1. **Wetlands –** The Project has been conducted consistent with the City of Arcata General Plan and the Humboldt County General Plan. Please see Section 3.3.3 (Biological Resources, Regulatory Framework). Regional and local policies are considered beginning on page 3.3-14 and specifically include wetland-related policies. Wetland identification did occur (Humboldt County General Plan Policy BR-P7 - Wetland Identification and City of Arcata General Plan Policy RC-3a). Impacts to wetlands will not occur as a result of the project, as explained in Master Response 8 regarding impacts to wetlands.

The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

2. **Historic Resources** – The comment is vague and does not specifically name which sections of which General Plan the Project "disregards." The historic resources study conducted for this Project complies with all local regulations as presented in Section 3.4 of the DEIR. Please see Section 3.4.3 (Cultural Resources, Regulatory Framework). Regional and local policies are considered beginning on page 3.4-6, which specifically consider historic resources. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

3. **Scenic and Rural Designations of Jacoby Creek Road and Old Arcata Road** – As evaluated in Section 3.1 (Aesthetics), Impact C, page 3.1-10, the *Project would be compatible with the existing visual character of the proposed Project alignment and its surroundings. The Project would not introduce any elements that would degrade the existing visual character or quality.* Please see Section 3.1.3 (Aesthetics, Regulatory Framework). Regional and local policies are considered beginning on page 3.1-3. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-7

Potentially significant unmitigated impacts on historic resources

Comment 46-7 asserts potentially significant impacts on historic resources. The City provides responses to the specific issues below. The commenter states that the DEIR "omits consideration of" several historic resources that are, in fact, addressed in the DEIR, as well as the special studies developed for historic resource evaluation. Please also see all responses to Comment Letter 14, which raises many of the same concerns, Master Response 7 regarding historical resources, and Master Response 10 regarding the Architectural Area of Potential Effect Maps. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

1. **Analysis omits residence in APE in the National Historic Register** - The DEIR considered all historic-era properties in the APE, of which there are three. The only property in the APE that is on the National Register is the Old Jacoby Creek School. See Section 3.4 (Cultural Resources), pages 3.4-12 through 3.4-20 for consideration of these properties.

2. **Analysis downplays the historic nature of Bayside Corners** - The historic context for Bayside is presented in Section 3.4 (Cultural Resources), pages 3.4-1 and 3.4-2. The historic context in the DEIR is a condensed version of the context from the HRER prepared for the DEIR. Please also see all responses to Comment Letter 14, which raises the same concerns, as well as Master Response 7, which addresses Historical Resources.

3. **Nineteen residences determined by the 1978 study to be eligible for inclusion in an historic district** - For information related to the 19 residences in the 1978 study, please see Response to Comment 14-15.

4. **Fifty-eight dwellings constructed during the period 1945-1965** - For information related to the 58 post-World War II dwellings, please see Response to Comment 14-16.

5. **Property [evaluation] for their significance at the state and local level [for] association with [significant and historic] events** – The HRER, incorporated by reference, and DEIR evaluated all properties that may be directly, indirectly, or cumulatively impacted by the Project (see DEIR Section 3.4.5 Methodology and Section 3.4.6 Impact CR-1). Properties absent the potential for impact by the Project were excluded from the Area of Potential Effect (see also Master Response 7 regarding historical resources and the Area of Potential Effect). The updated Historical Resources Evaluation Map, incorporated as errata in Appendix A, shows the properties that are potentially affected. These properties were also listed in the DEIR (Section 3.4.6 Impact CR-1, starting on page 3.4-14). Properties that were potentially affected were evaluated to determine their status as an historic resource pursuant to CEQA Guidelines Section 15064.4. Of the six properties adjacent to and surrounding the proposed roundabout, three were historic and the remaining three were not historic. The DEIR considered all historic resources in the APE, regardless of which criterion was used to determine their historicity, including significance with state and local association with significant and historic events. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

6. **Visual impact on historic resources in and adjoining the APE –** This comment raises concerns regarding visual impacts on historic resources in and adjoining the APE, but does not provide substantial evidence to substantiate the concern. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion.

   Impacts analysis for the resources in the APE and adjoining areas can be found in Section 3.4 of the DEIR (Cultural Resources), pages 3.4-15 through 3.4-20. Please also see Master Response 7, which discusses potential visual impacts and the effects of visual impacts on the setting of historical resources. As discussed in Master Response 7, parcels in and adjoining the Area of Potential Effect with no potential for physical or visual impact from the Project were excluded from further analysis. The three historic properties near the proposed roundabout (Old Jacoby Creek School, former Bayside Grange, and Temperance Hall) were evaluated for potential impacts, including potential impacts related to visual changes/changes in setting (Section 3.4.6 Impact CR-1, starting on page 3.4-14). Additionally, properties with historic status outside of the Area of Potential Effect (1365, 1686, 1752, and 1786-1788 Old Arcata Road) were also evaluated for potential impacts, including potential impacts related to visual changes/changes in setting (Section 3.4.6 Impact CR-1, starting on page 3.4-18). Thus, the DEIR does evaluate the potential visual impact on historic resources in and adjoining the Area of Potential Effect that could occur as a result of the Project. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

7. **Adverse impacts on the Old School House** - Impacts analysis for the Old Jacoby Creek School is in Section 3.4 (Cultural Resources), pages 3.4-15 through 3.4-16.

   a. **Views of and from the Old School House** – This comment raises concerns regarding visual impacts to the historic Old Jacoby School House yet provides no substantial evidence to substantiate an environmental impact. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. Please see page 3.4-16 of the DEIR, which

evaluates potential impacts to the Old Jacoby Creek School based on the HRER and concludes any resulting changes would result in a less than significant impact to the historic resource. Specifically, with respect to the Old Jacoby Creek School, the DEIR reads in part:

> *…The improvements directly along the parcel frontage of the Old Jacoby Creek School would be minimal and generally consistent with the current use and appearance. In addition, these improvements would be about 125 feet from the building and other Project elements associated with the roundabout would be further away, the nearest being the concrete traffic splitter island on Jacoby Creek Road about 175 feet from the school, and the center of the roundabout approximately 250 feet from the school. Visibility of the proposed improvements would be impaired by the distance and the existing large trees, hedge, and other vegetation between the school and the proposed Project work…*
>
> *…The character-defining features of the property would not be altered in any way by the Project and the general setting would remain unchanged. The visual and atmospheric changes resulting from the Project would be minimal, distant, and largely obscured from view, and thus, not cause a substantial adverse change to the historical resource…*
>
> *… These alterations have changed the setting of Bayside Corners and the immediate surroundings of the Old Jacoby Creek School since 1903 when the building was constructed, yet this property and Bayside Corners still maintain a rural feeling and setting sufficient for this property to be deemed to have integrity in 1985 when it was listed in the NRHP, and the Project would not substantially alter the surroundings such that this property can no longer convey its significance…*

The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

b. **Loss of parking** - Parking is not an environmental issue as defined in the CEQA Guidelines and Appendix G, Environmental Checklist, and parking will continue to be available in the general vicinity. Please see Master Response 3 regarding parking. There does not appear to be a foreseeable future impact to the Old Jacoby Creek School that can be correlated with a reduction in parking. For such an impact to occur, the proposed change in parking for users of this property would need to result in a severe modification of behavior such that operations at the former school would shift in dramatic ways that lead to neglect of the property such that its historic integrity of materials, workmanship, and feeling would be greatly diminished. There is no evidence to indicate that this would occur as a result of the proposed project. The commenter does not provide substantial evidence to support the claim that the changes to parking would result in a significant impact to any historic resource (CEQA Guidelines Sec. 15064(f)(5)). Construction of a new parking area on the parcel would likely require its own clearance under CEQA, which would result in a process that would likely result in efforts to minimize impacts to the historical resource. For additional information, please see Master Response 3 regarding parking.

c. **Loss of building access other than driveway** – Site access is not an environmental consideration as defined in the CEQA Guidelines and Appendix G, Environmental Checklist. Uncontrolled access to private property from public rights-of-way is neither desirable, considering transportation and land use planning principles, nor guaranteed, implicitly or explicitly, regardless of past use. Further, the Project design does not include any elements that would limit site access

to the Old Jacoby Creek School property to just the driveway. A new four foot sidewalk with a six inch curb would be constructed in front of the portion of the property nearest the current post office. The roadway would be repaved (no sidewalk extension) in front of the balance of the property's frontage of Jacoby Creek Road.

d. **Headlights** - The potential for the Project to cause vehicle headlights to shine in the windows of the Old Jacoby Creek School would not alter the eligibility of the historical resource. Such a potential occurrence would not diminish the integrity of materials, workmanship, design, association, location, setting, or feeling of the property. See also Response to Comment 7-14.

e. **Noise** - For information regarding the project building the roadway closer to Mistwood Education Center (Temperance Hall) and the possible increase in noise, please see Response to Comment 46-18.

8. **Hydraulic pounding and vibration -** Vibration analysis for the Project is in Section 3.10 of the DEIR. Vibration analysis results showed that the Project would not create vibrations that could damage buildings. Furthermore, none of the historical buildings are made of sensitive materials such as adobe or unreinforced masonry. Please also see Master Response 4 regarding noise and vibration.

Response to Comment 46-8

Potentially significant unmitigated impacts on scenic resources

The comment discusses potentially significant unmitigated impacts to scenic resources yet provides no substantial evidence. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion.

Please see Response to Comment 46-6, Item 3 regarding the impacts to the visual character of the community. Please also see Master Response 7 regarding historical resources. According to the California Scenic Highway Mapping System, there are no designated state scenic highways in the Project vicinity. Two routes are locally designated as coastal, and non-coastal, scenic highways in the Arcata General Plan (Policy D-3a). These include: Old Arcata Road, from Bayside Cutoff to Crescent Drive (coastal scenic highway designation); and Jacoby Creek Road (non-coastal scenic highway designation). The commenter cites Old Arcata Road as a scenic highway. However, no formal designation of the roadway as a scenic road or coastal scenic highway has been made by any agency. As such, it is not evaluated in the DEIR as a scenic highway.

The CEQA Checklist (CEQA Guidelines, Appendix G) defines public views as those that are experienced from publicly accessible vantage points. The checklist asks if the project would substantially degrade the existing visual character or quality of public views of the site and its surroundings. The comment contends that the project would, in fact, "destroy" such views. However, the City has received several comments suggesting the opposite conclusion. Since aesthetics is inherently fairly subjective, some case law has set the threshold for expertise fairly low. For example, in *Eureka Citizens for Responsible Gov't v City of Eureka (2007),* the courts found aesthetic impacts to be a "qualitative judgement not a set of quantifiable parameters (147CA4th at 376). Despite the potentially low threshold for expertise in the field of aesthetics, the claim was unsubstantiated by facts. In addition, the City also received several comments citing the improvement the Project will have on public views in the record, as well as several facts demonstrating the Project will not have an adverse impact on public views. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-9

Potentially significant unmitigated impacts on the existing visual character of public view from the site.

The comment raises concerns about potentially significant unmitigated visual impacts. Aesthetic impacts were evaluated in Section 3.1 and utilized the visual resource evaluation conducted for the Project, as described in Section 3.15 (page 3.1-8). Visual resources and perceptions of impacts to aesthetics is highly subjective, and the commenter expresses the opinion that the project will destroy the rural visual character, including pastureland, farms houses, fields, gardens and views of trees and mountains. Arcata General Plan Design Element Policy D-3d identifies Old Arcata Road from Bayside Cutoff to Jacoby Creek Road as a Scenic entryway. The policy specifically calls for improvements to enhance the appearance of the entryways with "landscaping, pedestrian enhancements, and directional signing" among other "appropriate...structures." The objective of the Scenic routes, resources and landscape features includes reducing visual impacts to minimize impairment and obstructions" that still allow for "reasonable development." Please see Impact AES-a and Impact AES-b, starting on page 3.1-8. As noted, among other details:

– The visual resource evaluation concluded that Project elements are low in elevation (at or near the ground elevation) and would not significantly obstruct or alter existing visual resources along the Project corridor (GHD 2020).
– The existing viewscape would not be impeded or altered by structures or other Project elements.
– The retaining wall and fencing (near the roundabout) would not impede views within or adjacent to the Project corridor or otherwise diminish the visual character of the vicinity.
– Views of the Project corridor would be relatively limited as the project consists mostly of narrow paved surfaces with few vertical features, such as resurfaced roadway, and re-striped lanes and crosswalks.

The Project does not include any features that would impact views of pastureland, farm hours, fields, gardens, or mountains in the viewshed. Furthermore, the project is consistent with the City's General Plan scenic resources preservation policies creating a scenic entryway at the designated Old Arcata Road and Jacoby Creek Road intersection. Please also see Response to Comment 46-8. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-10

Substantial light or glare.

1. **Headlights** – The potential for the Project to cause vehicle headlights to shine in the windows of the Old Jacoby Creek School would not alter the eligibility of the historical resource. Such a potential occurrence would not diminish the integrity of materials, workmanship, design, association, location, setting, or feeling of the property. See also Response to Comment 7-14. Additionally, the Project would not alter the environmental baseline condition specific to headlight glare, such as the number or type of vehicles using the roadway during nighttime hours. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

2. **Streetlights** – The comment asserts headlights on the realignment roadway and five overhead street lights would adversely impact nighttime views of the area and shine into the windows of historic Old Jacoby School House. However, this vague comment provides no substantial evidence. Please see

Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. As described in Section 2.5.8 of the Project Description (page 2-6), lighting will be designed to protect wildlife and nighttime views, including views of the night sky. The Project will be designed to be consistent with the City's design guidelines, Section 9.30.070 (Outdoor Lighting) of the Arcata Land Use Code, and the recommendations of the International Dark-Sky Association, which includes standards for fixtures, shielding, wattage, placement, height, and illumination levels. To comply with these requirements, lighting for the Project will be the minimum lumens necessary, directed downward, shielded, and pedestrian level when feasible. This will ensure lighting is contained within the site and does not cause significant lighting and glare impacts for surrounding land uses and sensitive habitat areas. As such, proposed new lighting, which is limited to the roundabout only, would not significantly alter nighttime views.

The threshold of significance for determining the potential impact of new light and glare is based on the discretion of a lead agency on a case by case basis, considerate of specific factors such as:

- The change in ambient nighttime levels as a result of project sources; and
- The extent to which project lighting would spill off the project site and affect adjacent light-sensitive areas.

As analyzed in Section 3.1 (Aesthetics) under Impact AES-d (d) on page 3.1-11, design standards applied to new street lighting would limit alteration of ambient nighttime levels and spillage to adjacent areas. Given nighttime views would thus not be adversely affected with the application of dark sky compliant design standards, the impact determination in the DEIR concluded any potential effect resulting from the street lights (and the rapid flashing safety lighting at upgraded and new crosswalks) would be less than significant.

The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-11

Cumulatively considerable increase in pollutants and exposure of sensitive receptors to pollutants

Bayside Cares comments that a decrease in parking will lead to additional vehicular idling, which in turn will result in exposure of sensitive receptors to exhaust emissions yet provides no substantial evidence. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. The commenter's assertion that removal of parking spaces would cause a 'large increase in motor vehicles idling in the roadway' appears to assert that instead of parking (as is the existing condition), motorists would leave their vehicles idling in the roadway in order to either exit their vehicles and visit buildings adjacent to the roadway, or remain in the lane while another occupant leaves to visit adjacent buildings. Leaving a running vehicle stopped and idling in the roadway is illegal. Please see Master Response 3 regarding parking, and Master Response 2 regarding substantial evidence.

As stated in Draft EIR Section 3.11 (Transportation) Impact TR-b, the proposed Project would not increase the length of roadway, add new roadways, or increase the number of travel lanes, there would be no increase in vehicle miles traveled. By promoting multi-modal transportation, the Project would reduce vehicle miles traveled through the Project Area. Thus, the Project would result in reduced emissions in the Project Area, as individuals and families would be more able to safely walk or bicycle throughout the community of Bayside. Draft EIR Section 3.2 (Air Quality) Impacts AQ-b and AQ-c conclude that following

construction, the Project would not include any stationary sources of air emissions, traffic capacity enhancements, or any increase in levels of traffic over existing conditions. The proposed roadway improvements will likely increase non-emitting bicycle and pedestrian use of the roadway, which may decrease VMT and associated emissions.

Response to Comment 46-12

Impacts to wetlands

Please see Master Response 8 regarding wetlands. Impacts to wetlands will not occur as a result of the Project.

Response to Comment 46-13

Adverse change in the significance of historical resources

The adverse effects analysis is presented in Section 3.4 (Cultural Resources), pages 3.4-14 through 3.4-20. See also Response to Comment 14-15.

Response to Comment 46-14

Archaeological impacts –lack of tribal monitor

This comment notes concern regarding archaeological impacts and lack of tribal monitors. In fact, Mitigation Measure CR-1 (page 3.4-21) specifically notes that the required Memorandum of Understanding to be completed with consulting tribes will include details regarding when and where tribal and/or archaeological monitors would be needed, to the satisfaction of consulting tribes. This mitigation measure was developed in consultation with the three area Wiyot Tribal Historic Preservation Officers through formal AB52 Consultation. The analysis and mitigation measure were specifically approved by the Tribes to mitigate any potential cultural resources impacts to be less than significant. In addition, extensive pre-disturbance archaeological work has been completed to ensure that the proposed mitigation is sufficient to address the Wiyot Tribes concerns. No further response is required.

Response to Comment 46-15

Additional of impervious surface to substantially increase the amount of surface runoff

The comment speculates the additional of impervious surface will substantially increase the amount of surface runoff yet provides no substantial evidence. Contrarily, the City's DEIR analysis on stormwater and related runoff were evaluated by the Project's licensed Professional Engineer, who developed a specific mitigation measure to ensure the Project does not cause or exacerbate surface runoff. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion, Master Response 5 regarding drainage, and Master Response 9 regarding standards of adequacy of an EIR, citing Section 15151 of the CEQA guidelines.

Increases in impervious surface were evaluated in Section 3.9 (Hydrology and Water Quality), Impact HWQ-c,iii (page 3.9-12). As noted, changes in impervious surface area would increase by less than 0.03% of the total 12.8 acre Project Area. The increases in impervious surface will primarily result from an extension of the pedestrian pathway, a new sidewalk along Hyland Street, and the new roundabout at the Jacoby Creek Road intersection. The Project includes expansion and improvements of bio-swales to enhance surface stormwater management.

The Project's stormwater design would accommodate any additional stormwater, however negligible, resulting from the increased impervious surface area. A substantial change in amount of surface runoff

would not occur. On-site and off-site flooding would not result from the Project. See also Master Response 5 regarding drainage, which includes numeric information regarding the anticipated change in impervious area.

The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-16

Projects results in the need to relocate existing utilities

Bayside Cares asserts the Project would conflict with existing utilities, including the sewer main, water main, and gas main, per a 2019 SHN report. This is incorrect. Please see Response to Comment 46-3, Item 2. The location of existing utilities has been incorporated into the design to ensure conflicts do not occur. Based on the information provided, conflicts with the existing underground gas line have been identified. If unavoidable conflicts are identified during final design, the utility owner would be notified and would be required relocate facilities.

Bayside Cares also contend the Project will result in the relocation or construction of new or expanded wastewater treatment or stormwater drainage facilities. As discussed in Section 3.13-6 (Utilities) of the DEIR, starting on page 3.13-6 (Impact UTL-c).

> *The Project would not directly or indirectly induce population growth and would not increase the amount of wastewater generated. The Project would install new and upgraded sewer laterals and associated connectors along a portion of Old Arcata Road; however, the replaced sewage infrastructure would not increase wastewater generation or capacity. Because there would be no increase in wastewater discharges, the Project would not impair the ability of the City of Arcata Wastewater Treatment Plant to continue serving existing commitments. No impact would result.*

Similarly, new stormwater drainage facilities are analyzed under Impact UTL-a (page 3.13-5). The impact analysis describes the planned improvements and specifically states service would not be expanded.

Please also see the following responses addressing re-stated concerns regarding planned sewer and water upgrades and storm drain improvements:

– Sewer utility upgrades – Please see Response to Comment 46-2, Item 2
– Water utility upgrades – Please see Response to Comment 46-2, Item 3
– Storm drain upgrades – Please see Response to Comment 46-1, Item 1

The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-17

Exposure of people and structures to significant downstream flooding

The comment notes the Project could potentially expose people and structures to significant risks of downstream flooding and drainage changes. Contrarily, the City's DEIR analysis on hydrology and flooding were evaluated by the Project's licensed Professional Engineer, who developed a specific mitigation measure to ensure the Project does not cause or exacerbate flooding. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion, Master Response 5 regarding

drainage, and Master Response 9 regarding standards of adequacy of an EIR, citing Section 15151 of the CEQA guidelines. Please also see Master Response 5 regarding drainage.

The existing area in the vicinity of the roundabout currently drains to the south (beyond the Project Area shown in Figure 2-5) through a network of open channels and underground pipes, which ultimately discharge to a drainage channel that is located within the FEMA 100-year floodplain. As noted, changes in impervious surface area would increase by less than 0.03% of the total 12.8 acre Project Area. The Project's stormwater design would accommodate any additional stormwater, however negligible, resulting from the increased impervious surface area. A substantial change in amount of surface runoff would not occur.

Under proposed conditions, new inlets and pipes will be installed and connected to the existing system that will continue to drain to the channel that is located within the FEMA 100-year floodplain. To ensure that the project does not exacerbate existing flooding or cause new flooding, a formal drainage study will be prepared (Mitigation Measure HWQ-1 (page 3.9-10 and 3.9-11) that will include a hydrologic and hydraulic analysis of both pre- and post-project conditions. To eliminate the potential for any increase in runoff resulting from new impervious surfaces associated with the project, the following would be incorporated into the project as necessary:

– Permeable pavement would be incorporated into the design in key locations (e.g., parking near the pumping station) to minimize new impervious surface and reduce surface runoff potential to pre-Project conditions, at minimum.
– The project would include subsurface storage facilities (e.g. larger pipes or parallel pipes) that would temporarily retain a volume of stormwater runoff and meter it out to match pre-project conditions.

As specified under Mitigation Measure HWQ-1, the analysis will ensure the proposed drainage has sufficient capacity to meet the Project's goals of improving drainage and avoid any significant drainage capacity-related impacts. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-18

Noise related impacts

This comment was previously addressed in Appendix E of the DEIR (Final IS/MND, Response to Comments, and Errata). Please see Master Response 4 regarding noise.

Response to Comment 46-19

Unmitigated cumulative impacts

The commenter claims that other past, present, and reasonably foreseeable future projects were not analyzed in the DEIR without specifying any projects that would warrant inclusion in the cumulative effects analysis. The DEIR did include an analysis of cumulative effects, per CEQA Guidelines Section 15355. The approach to cumulative impacts was addressed in Section 3 of the EIR (Analysis Overview), starting on page 3-2. As a result of queries to agencies and organizations, the cumulative project list in Table 3-1 was developed. Agencies and organizations identified in Section 3 were queried for recently completed, current or future projects within and near the Project Area. No additional potential cumulative projects were identified or have since been identified. Each of the projects identified in Table 3-1 was then evaluated under each subsequent section of the EIR, specific to resource categories in the CEQA Appendix G

checklist. CEQA Guidelines Section 15130 (Discussion of Cumulative Impacts) provides that an EIR should not discuss impacts which do not result in part from the project evaluated in the EIR. Furthermore, when the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall *briefly* indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement its fair share of a mitigation measure or measures designed to alleviate the cumulative impact. Additionally, CEQA Guidelines Section 15130(b) provides: *The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone.*

The cumulative impact methodology and analysis is consistent with the CEQA Guidelines. As a result of this methodical exercise, no cumulatively significant impacts were identified. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-20

Documents referenced in the EIR were not made public

Bayside Cares states all documents used in preparation of the EIR for supporting analysis should be made available for public review. Please see Master Response 10 regarding the architectural APE maps.

The City has posted all references cited in the DEIR online at: https://www.cityofarcata.org/720/Old-Arcata-Road-Design-Project. As an allowable exception, documents containing cultural and archaeology sensitive information have not been posted on the City's website.

As is common in the north coast region, the Project Area is proximal to archaeologically sensitive areas. These areas were thoroughly reviewed in the Project's Historic Properties Survey Report and associated attachments, including the Archaeological Survey Report and multiple subsurface investigations in order to determine significant impacts would not occur. Given the spatial specificity of these documents and associated figures, they are considered confidential. Disclosure of such documents to the public could unfortunately facilitate looting or damage of sensitive archaeological resource. Additionally, disclosure of the exact location of archaeological resources via mapping of the Area of Potential Effect (APE) is not germane to the impact analysis conducted in Section 3.4 (Cultural Resources), Impact CR-2 (starting on page 3.4-20), per the Archaeology Resource Evaluation Methodology detailed starting on page 3.4-13.

Regarding historical resources, Section 3.4.1 (Cultural Resources – Study Area) on page 3.4-1 specifically describes the APE as the Project's area of direct impacts (ADI), which are shown on Figures 2-2 through 2-5, plus six adjacent parcels that could experience a visual impact. The addresses of these six adjacent parcels (specific buildings) evaluated in the DEIR are explicitly noted with street addresses throughout Section 3.4. Thus, the location of these parcels and the buildings of interest is clear absent a separate associated figure or map. However, the historical resources evaluation map has been included in this FEIR under Appendix B.

The Project Area and key components are shown in Figure 2-2 through 2-5. From these figures, it is clear where the Project is located relative to the specific buildings noted with exact street addresses in Section 3.4, as well as the specific locations of each key design feature based on the existing 30% design for the Project.

The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-21

Project description deficiencies – details concerning storm drain improvements have not been provided

This comment re-asserts the whole of the project was not adequately described in the Project Description, as was also stated under Comment 46-3. Please see Response to Comment 46-3, Item 1.

Response to Comment 46-22

Project description deficiencies - conflicts with existing utilities

This comment re-asserts the whole of the project was not adequately described in the Project Description. Please see Response to Comment 46-2, Item 2 and Item 3 and Response to Comment 46-16.

Response to Comment 46-23

Project description deficiencies - conflicts with existing power poles

This comment re-asserts the whole of the project was not adequately described in the Project Description, as was also stated under Comment 46-3. Please see Response to Comment 46-3, Item 9.

Response to Comment 46-24

Project description deficiencies - Elimination of parking

This comment re-asserts the whole of the project was not adequately described in the Project Description. Please see Response to Comment 46-2, Item 4.

Response to Comment 46-25

Project description deficiencies - failure to describe protection measures for to protect sight and hearing impaired children at crosswalks near the roundabout

This comment re-asserts the whole of the project was not adequately described in the Project Description. Please see Response to Comment 46-2, Item 7.

Response to Comment 46-26

Project description deficiencies - impacts to wetlands within and adjacent wetlands

This comment re-asserts the whole of the project was not adequately described in the Project Description. Please see Master Response 8 regarding wetlands.

Response to Comment 46-27

Project description deficiencies - wetland impacts and associated compensatory mitigation

This comment re-asserts the whole of the project was not adequately described in the Project Description. Please see Master Response 8 regarding wetlands.

Response to Comment 46-28

Project description deficiencies - failure to address bicycle safety in the roundabout, which has no bike lanes

This comment re-asserts the whole of the project was not adequately described in the Project Description. Please see Response to Comment 46-3, Item 7.

Response to Comment 46-29

Inconsistent Description of Impact on Utilities and Drainage

1. **Entire drainage plan not described** – The comment erroneously conflates a mitigation measure with the project description. Please see Response to Comment 46-3, Item 1. CEQA Guidelines Sec. 15124, requires a project description to be adequately detailed to identify environmental impacts of the proposed project. The 30% design used in the DEIR is sufficiently detailed to identify that the Project will result in drainage modifications. As a result, the DEIR identifies the requirement for a drainage study to mitigation any potential significant impact. The mitigation measure is not the project description. it is the result of the environmental analysis.

   It is inconsistent with the purpose of CEQA to fully design a project before assessing its potential environmental impacts. The purpose of CEQA is to disclose environmental impacts and develop plans to avoid or mitigate the environmental impacts *before* deciding to approve or move forward with a project. Committing to a 100% project design solely to include the drainage design into the project description runs counter to common sense and good practice. The comment does not present a new environmental impact or concerns that were not fully addressed in the DEIR. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

2. **Impacts to existing utilities** - Please see Response to Comment 46-2, Item 2 and Item 3 and Response to Comment 46-16.

3. **Omission of finished road grade and resulting impacts on drainage** – Please see Response to Comment 46-2, Item 9.

Response to Comment 46-30

Insufficient information regarding the Project's construction schedule

The commenter states that the DEIR does not provide the number of construction workers, an estimated number of trucks for deliveries, or where vehicles would be parked during construction. The commenter further states that the DEIR does not identify how construction would impede or block motor vehicles, bicycle or pedestrians. Parking for construction personnel and equipment would be accommodated within the staging areas (see Section 2.6.3 on page 2-7). All vehicles will be required to be parked in legal locations. Two-way traffic would be maintained throughout construction, with short-term lane closures controlled by flaggers.

Consistent with CEQA Guidelines Section 15124 (Project Description), the DEIR Section 2 (Project Description) provides a general description of the Projects' technical and environmental characteristics. The section also describes that a Temporary Traffic Control Plan would be developed by the contractor and approved by the authority having jurisdiction over the facility prior to Project implementation to ensure that traffic control devices and features through the work area are implemented in accordance with the California MUTCD. The provision of a Temporary Traffic Control Plan is standard practice and required by both the City of Arcata and County of Humboldt for construction projects within their respective jurisdictions.

In addition to the construction schedule provided in DEIR Section 2.6, DEIR Section 2.6.3 (Construction Staging Areas) provides that staging is expected to occur within the project footprint, and that for impact analysis purposes, two staging areas were preliminarily identified—one at the southern end of the Project corridor and the other at the northern end of the Project corridor.

Pursuant to CEQA Guidelines Section 15144 (Forecasting), drafting an EIR necessarily involves some degree of forecasting. The DEIR discloses that moderate number of construction vehicles and equipment, worker trips, and truck trips that would be required for a Project of this scale. Trips associated with the Project construction were estimated to consist of up to 68 trips per day as stated on page 3.5-5 (Energy), and construction equipment would remain staged in the Project Area once mobilized, as noted in Section 2.6.3 on page 2-7. Additionally, detailed assumptions on construction worker and hauling trips are provided in DEIR Appendix C, CalEEMod Output.

Transportation impacts associated with Project construction are evaluated in Section 3.11.6, Impact TR-a. As stated in the DEIR, during construction, traffic controls would be implemented. In accordance with jurisdictional requirements, the construction contractor would be required to obtain encroachment permits and temporary traffic control approvals from the City of Arcata and County of Humboldt prior to beginning the work within their respective rights of way. As part of the encroachment permit process, the construction contractor would be required to prepare a traffic control plan for review and acceptance of planned work within the public right of way. The development and implementation of a traffic control plan would include, but not necessarily be limited to: temporary traffic control systems, delineators, signs, and flaggers conforming to the current California Manual of Uniform Traffic Control Devices. Per CEQA Guidelines Section 15151, the environmental analysis need not be exhaustive. Rather, it must be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision. The DEIR provided a level of detail that was reasonably attainable and feasible consistent with Section 15151. Response 9 regarding standards of adequacy of an EIR.

As a standard requirement, the City will require the Project contractor to develop and implement a temporary Traffic Control Plan outlining work zones, activities, and time needed to complete the work in each zone. As part of the Traffic Control Plan, the Project would be required to keep at least one lane open in each direction of travel on Old Arcata Road at all times during the construction process. Work performed on the segment adjacent to Jacoby Creek Elementary School and Mistwood Education Center at the intersection of Jacoby Creek and Old Arcata Roads would be scheduled in coordination with School Administration and would avoid work coincident with the school's start and end times, when traffic congestion is typically high. The impact analysis concludes that the Project's construction-period impacts to transportation would be less than significant.

DEIR Impact TR-d contains an evaluation of the Project's construction-period impacts on emergency access and finds that, with implementation of Mitigation Measure TR-1, the temporary impact of construction activities on emergency access to a less than significant level by requiring the City and its contractors to have ready at all times the means necessary to accommodate access by emergency vehicles, as well as to notify emergency responders in advance of construction activities.

No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-31

Traffic Impact Analysis is Required

This comment questions the very need for the Project as proposed on the basis that a traffic impact analysis has not been completed to prove the Project is necessary. There is no local, state, or federal

requirement to complete a traffic impact analysis; moreover, Level of Service is no longer evaluated in the CEQA Appendix G Environmental Checklist under Transportation, per the 2021 CEQA guidelines. In addition, unlike signals or stop controls, there are no warrants for roundabouts currently included in the CA MUTCD. Instead, roundabouts are justified on their own merits as the most appropriate intersection treatment alternative for each specific application. The City used five years of scoping, community engagement, preliminary design and technical studies to determine the need and scope of the proposed Project. Additionally, alternatives to the Project are discussed in Section 4 of the DEIR and did include consideration of a No Project Alternative and a Modified T-Intersection (Alternative 2). As included in Section 4.5 of the Alternatives Analysis (page 4-15), the environmental impacts of the Project and the Modified T-Intersection were found to be equivalent. Please see Master Response 6 regarding the lengthy community engagement process for the Project. Please also see Section 2.2 of the Project Description, which summarizes the Purpose and Need of the Project (page 2-1). Evaluation of potential transportation-related impacts did not require a traffic study. As stated in Section 3.11 (Transportation) under Impact TR-c on page 3.11-12, the Project design is consistent with applicable design guidelines.

This comment also asserts a traffic impact analysis is required to determine which of the listed alternatives is most appropriate for the traffic experienced in the Project Area. Under CEQA Guidelines Section 15126.6, alternatives must be reasonable and feasible, which is the case for the alternative included in the DEIR (Alternative 2: T Intersection). Under the CEQA Guidelines Section 15126.6 (d) alternatives are to be evaluated using their major characteristics and considerations of significant environmental effects, which was completed in Section 4 of the DEIR (Alternatives Description and Analysis). Given Level of Service (LOS) is no longer a consideration in the current CEQA Appendix G environmental checklist, completion of a traffic impact analysis is not a necessary study for the Project. Please see also Response to Comment 15-1 regarding VMT. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-32

Project's Design Poses Safety Hazards

The comment asserts the evaluation of the roundabout's geometric design features (see Section 3.11 Transportation, Impact TR-c, page 12) failed to consider the proximity of schools, businesses, and other gathering places, as well as the location of crosswalks in proximity to the roundabout. As stated on page 2-3 of the Project Description, *the design for the proposed roundabout geometrics, including bike ramps, follows the National Cooperative Highway Research Program (NCHRP) design standards (FHWA 2010). Design standards applied to proposed Pedestrian-Actuated Rectangular Rapid-Flashing Beacons (RRFB) follows the MUTCD Interim Approval for Optional Use of Pedestrian-Actuated Rectangular Rapid-Flashing Beacons at Uncontrolled Marked Crosswalks (IA-21).* Following these guidelines, the roundabout would not include any geometric design features, such as sharp curves, dangerous intersections, or other physical barriers that could injure users if improperly designed. The roundabout's proximity to schools, businesses, and community centers does not introduce any related geometric hazards. The existing Old Arcata Road is in similar proximity to cited activity areas and poses greater safety risks in the current road configuration and design. The roundabout would be surrounded with walkways and enhanced crosswalk to improve the safety of the intersection for users, as a goal and objective of the Project (see Section 2.3 of the Project Description, Goals and Objectives, page 2-2). The comment has been adequately addressed in the DEIR and responses to comments. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-33

Lack of Enforceable and Effective Mitigation Measures

The comment asserts mitigation measures are required for a number of concerns, summarized as:

– A reduction in parking, which in turn will lead to traffic jams and safety hazards by blocking roads and creating pedestrian hazards (see previous response under Comment 46-4, Item 1);
– A lack of bicycle lanes in the roundabout (see previous response under Comment 46-3, Item 7);
– A lack of provisions to prevent speeding near the roundabout on Old Arcata Road and Jacoby Creek Road, where speeding currently occurs (discussed below);
– A lack of provisions for conflicts between the Project's bicycle lanes and sidewalks with existing utility poles (see previous response under Comment 46-3, Item 9);
– A lack of provisions for the loss of parking near schools, which in turn will lead to idling vehicles safety hazards by blocking roads and creating pedestrian hazards (see previous response under Comment 46-4, Item 1); and
– A lack of provisions for conflicts between garbage cans and bike lanes (see previous response under Comment 46-3, Item 8).

These issues have been largely addressed as noted. As an exception, speeding is unfortunately an existing condition in the Project Area. Thus, an objective of the Project is to decrease speed and calm traffic (see Section 2.3 – Goals and Objectives), page 2-2. The Project Area does not include the straight stretch of Old Arcata south of the roundabout or the straight stretch on Jacoby Creek Road, beyond what is shown within the Project Study Boundary in Figure 2-5 of Section 2 (Project Description). The comment has been adequately addressed in the DEIR and responses to comments. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-34

Unanalyzed environmental impacts

This comment re-asserts previously raised concerns regarding underground utilities. These Project details have been adequately addressed in the DEIR and responses to comments. No amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts. Please see Response to Comment 46-16. Additionally, this comment asserts:

1. **Flooding in the APE may adversely affect the operation of underground utilities** – The comment cites potential adverse effects to underground utilities yet provides no substantial evidence. As stated in Section 3.9 (Hydrology and Water Quality), Impact HWQ-d (page 3.9-13), the Project Area is not located within the FEMA 100-year flood zone. Additionally, the Project will not exacerbate existing flood risk or flood conditions within the Project Area. The City's DEIR analysis on flooding and potential impacts was evaluated by the Project's licensed Professional Engineer, who developed a specific mitigation measure to ensure the Project does not cause or exacerbate surface runoff or contribute to flooding. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion, Master Response 5 regarding drainage, and Master Response 9 regarding standards of adequacy of an EIR, citing Section 15151 of the CEQA guidelines. This comment does not raise any new environmental impacts and no amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

2. **Groundwater quality may be adversely affected by digging and flooding in the area, which could adversely affect private wells** – The comment raises concern regarding groundwater impacts but provides no substantial evidence. The City's DEIR analysis on groundwater impacts was evaluated by the Project's licensed Professional Engineer and qualified environmental scientists. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion, Master Response 5 regarding drainage, and Master Response 9 regarding standards of adequacy of an EIR, citing Section 15151 of the CEQA guidelines.

   Project construction is expected to have minimal, if any, interaction with shallow groundwater and no interaction with deeper groundwater (greater than ten feet). Please see Section 2.6.4 of the Project Description regarding construction dewatering. As stated above in Section 3.9 (Hydrology and Water Quality), Impact HWQ-c and Impact HWQ-d (page 3.9-12 and 13), the Project would not affect flooding in the Project Area. Additionally, the Project would benefit operational storm drainage, as explained in Master Response 5. Construction or operationally-related adverse effects to groundwater, including private wells located near the Project Area, would not be affected whatsoever. Additionally, replacement of sewer laterals will improve groundwater quality. This comment does not raise any new environmental impacts and no amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Response to Comment 46-35

Unanalyzed impacts to wetlands

This comment re-asserts concerns related to impacts to wetlands in and near the Project Area. Please see Response to Comment 46-2, Item 6, as well as Master Response 8 regarding wetland impacts. Wetlands will not be impacted as a result of the Project.

Response to Comment 46-36

Unanalyzed impacts to air quality

This comment re-asserts that a loss of parking will in turn lead to an increase in idling vehicles and thus an increase in vehicle-related exhaust emissions. Please see Response to Comment 46-11.

Response to Comment 46-37

Inconsistencies with applicable County General Plan requirements

This comment re-asserts allegations of conflicts with County General Plan Requirements regarding wetlands, historic resources, and drainage.

1. **Wetlands** – Please see Response to Comment 46-6, Item 1

2. **Historic Resources** – Please see Response to Comment 46-6, Item 2. The Project does follow Humboldt County General Plan Section CU-P1. Identification of historical resources is located in Section 3.4 (Cultural Resources), pages 3.4-11 through 3.4-13. Impacts analysis is on DEIR pages 3.4-14 through 3.4-20.

3. **Drainage** – Please see Master Response 5 regarding drainage. This comment asserts there are numerous blocked culverts within the Project footprint; however, no such blocked culverts are currently known by the City toy exist. As outlined in Master Response 5, the Project will upgrade existing ad hoc and undersized culverts to improve drainage throughout the Project Area.

Response to Comment 46-38

Inconsistencies with applicable City General Plan requirements

This comment asserts allegations of conflicts with the City of Arcata's General Plan, as outlined below.

1. **Parking and Idling Vehicles** - The comment re-asserts a decrease in parking will lead to an increase in idling vehicles and traffic hazards. Please see Response to Comment 46-4, Item 1.

2. **Traffic Bottlenecks at Roundabout** - The comment asserts vehicles stopping for pedestrians in crosswalks at the roundabout would create traffic bottlenecks yet provides no substantial evidence. Please see Master Response 2 regarding substantial evidence, speculation, and unsubstantiated opinion. Under existing conditions, there are not any crosswalks at the intersection of Old Arcata Road and Jacoby Creek Road, and community members are forced to cross the roadway absent any pedestrian facilities. The Project proposed to integrate two new crosswalks into the intersection to facilitate pedestrian safety and improve the overall walkability of the community. The City does not concur that enhancing the walkability of the community should be considered an impairment to the drivability of the intersection or that motor vehicles should be prioritized over pedestrians. The level of pedestrian use at the intersection is not expected to increase substantially over existing conditions. The commenter misreads Arcata General Plan Policy AQ-2c and -2d. Policy 2c supports "minor capacity impoverishments" to "minimize the delay and congestion" at intersections. The policy seeks to improve flow for all modes and specifically cites improvements for walking, bicycling, and transit use on intersection improvements for flow, but not capacity. This Project achieves those objectives. Policy 2d specifically identifies roundabouts as implementing the policy. In addition, it supports such improvements consistent with other modes on Arcata's arterials. The Project is not only consistent with Policy AQ-2d, Project elements are specifically identified as the desired condition on Old Arcata Road (see inset figure in Arcata General Plan Policy AQ-2d). This comment does not raise any new environmental impacts and no amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

3. **Wetlands** - The comment re-comments required compensatory mitigation for impacted wetlands would not occur. Please see Response to Comment 46-2, Item 6, as well as Master Response 8 regarding wetland impacts. Wetlands will not be impacted as a result of the Project.

4. **Scenic Routes and Resources** – Please see Response to Comment 46-6, Item 3, Response to Comment 46-8, and Response to Comment 46-9. The Project will not adversely impact Old Arcata Road and Jacoby Creek Road as asserted.

Response to Comment 46-39

Unrecognized Impacts to Historic Resources

The comment asserts the Project could result in unrecognized impacts to historic resources. Please see Master Response 7 regarding historic resources. Please also see Master Response 9 regarding standards of adequacy for an EIR, which includes a discussion of disagreement among experts. This comment provides a letter from a historic resource consultant that includes some substantial evidence in the record that there is an environmental impact on historic resources. This letter provides an interpretation and facts that lead to conclusions that differ from those provided in the DEIR (Section 3.4 – Cultural Resources, Impact CR-1, starting on page 3.4-14). However, the DEIR provides substantial evidence to support the determination that there are no significant impacts to historic resources. Contrary to the commenter's claims, all of the historic, potentially historic, and buildings constructed more than 45 years ago that are

within the vicinity of the project were considered and/or evaluated (JRP 2020 and DEIR Section 3.4.5 Cultural Resources Methodology). Disagreement among experts does not make the DEIR inadequate (CEQA Guidelines Sec. 15151), and the City must determine, based on the whole of the record, whether to certify the EIR (CEQA Guidelines Secs. 15090 and 15091).

Additionally, the establishment of the APE followed Secretary of the Interior/National Park Service guidelines and standard practices. Methodology and justification for the APE is in Section 3.4 (Cultural Resources), page 3.4-11 and 3.4-18. The APE includes or excludes parcels based on different Project elements in different areas, specifically the roundabout versus minor roadway improvements elsewhere.

It is in fact accurate to say that 2212 Jacoby Creek Road, 1928 Old Arcata Road, and 2297 Jacoby Creek Road are “outside of the County right of way.” They are private properties/parcels that are not inside of the public County right of way. They are also “adjacent to the County right of way, inside the County planning jurisdiction and outside Arcata City limits.” The impacts analysis for these three properties is Section 3.4 (Cultural Resources), pages 3.4-15 through 3.4-17.

No part of the parcels at 1666 Old Arcata Road and 1972 Old Arcata Road are in the APE. They are also not among the four known or potential historic properties outside the APE as described on pages 3.4-12 and 3.4-13.

The “58 post war era structures” referenced in the comment is from a 2017 report by DZC Archaeology & Cultural Resource Management (mistakenly cited as SHN 2017 in the comment). This comment is inaccurate. The DZC report identifies 58 “structures” built between 1945 and 1965 along the Project corridor. The DZC report does not define a period of significance or claim that any of the 58 properties are historically significant, historical resources under CEQA, or historic properties under NHPA Section 106. The comment does not include the remainder of the paragraph cited, which contradicts the commenter’s assertion that these properties should have been surveyed. The DZC report states: “Approximately fifty-eight additional structures dating from the Post-War era (1945-1965) are adjacent to the ROW and meet the age threshold for consideration as historic resources. These structures are as of yet unsurveyed and unevaluated. The level of effort to identify and evaluate historic resources should be commensurate with the level of risk inherent in the project. At this time, the project proposes to conduct minimal construction activities within an established streetscape already replete with non-historic period infrastructure including paving, streetlights and utility poles and which have already altered existing views in the area. A full scale architectural survey for these structures is not recommended at this time.” (DZC 2018, Section 6.6).

Generally, the HRER and cultural resources chapter of the DEIR supplant the DZC report, which was prepared solely from archival research and a Northwest Information Center records search and no field survey was performed by DZC. Furthermore, the DZC report was a preliminary scoping document as acknowledged therein: “This report was prepared to provide a current conditions assessment of known cultural resources and recommendations to assist in project planning. Firm recommendations or mitigation measures cannot be identified until final project activities are delineated” (DZC 2018, Section 7).

The 19 properties the commenter cites from the 1978 report were not evaluated because they are not in the APE. The DEIR does recognize the four properties identified in the 1978 report that are within the Project corridor and that were determined eligible for the National Register, but outside of the APE. These four and the potential for a historic district inclusive of properties outside of the APE are discussed on pages 3.4-12 and 3.4-13 and 3.4-18 through 3.4-20. The commenter, in citing the 1978 report, seems to be referring to the November 3, 1978 SHPO letter attached to a PDF of the 1978 report. In this letter, SHPO recommends these properties are individually eligible. SHPO does not recommend the properties eligible as an historic district, nor does the text of the 1978 report suggest a historic district, or recommend an eligible historic

district. Note that the SHPO letter recommends 32 properties eligible for the National Register, but only the four discussed in the DEIR are along the Project corridor.

The two roadways in the APE – Old Arcata Road and Jacoby Creek Road – were not evaluated for significance because these are modern roadways (JRP 2020). Repaving and widening have transformed these structures into modern roadways. The historic roads are no longer extant (JRP 2020). No other structures are on the APE.

The DEIR does not state that the period of significance is 1875-1925. This is the date range covered in the Historic Context section of Section 3.4 (Cultural Resources), on pages 3.4-1 through 3.4-2, which is a condensed version of the historic context from the HRER. A historic context is a history of the area; a historic context does not define a period of significance.

Additionally:

– Impact analysis is presented Section 3.4 (Cultural Resources), pages 3.4-14 through 3.4-20.
– Discussion regarding the APE and its relationship with the Bayside Specific Plan District and Neighborhood Conservation Area is Section 3.4 (Cultural Resources), 3.4-12, 3.4-13 and 3.4-18 through 3.4-20.
– Vibration analysis for the Project is in Section 3.10 of the DEIR. Vibration analysis results showed that the Project would not create vibrations that could damage buildings. Furthermore, none of the historical buildings are made of sensitive materials such as adobe or unreinforced masonry. Please also see Master Response 4 regarding Noise and Vibrations.
– Drainage analysis is in Section 3.9 of the DEIR. Please see also Master Response 5 regarding drainage.
– Discussion specific to the Temperance Hall/Mistwood Education Center is in Section 3.4 (Cultural Resources), page 3.9-12.

This comment does not raise any new environmental impacts and no amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

Comment Letter 47

From: wendy caruso
To: COM DEV
Subject: Old Arcata Road Draft EIR comment
Date: Monday, September 27, 2021 4:58:06 PM

Dear David Loya,
I am writing in support of the proposed roundabout at the intersection of Old Arcata Road and Jacoby Creek Road. I am a resident of Bayside and my children currently attend Jacoby Creek Elementary School.

A roundabout at the Old Arcata Road & Jacoby Creek Road intersection would make it much safer for my children to walk or bicycle to school. I often observe vehicles exceeding the speed limit on Old Arcata Road as they drive through that intersection. These speeding vehicles make it very difficult to cross the street in that area. 47-1

I also support sidewalks on Old Arcata Road and Hyland streets. Sidewalks would make it much safer for my children to walk to school.

I currently drive my children to school most days. If the proposed plan, with the roundabout, comes to fruition, I would feel safe to send my children to school independently. 47-2

Thank you,
Wendy Caruso

Letter 47 – Response to Comments

Response to Comment 47-1

Letter of support

This comment offers support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Response to Comment 47-2

Support for sidewalks

This comment offers support for sidewalks on Old Arcata Road. Please see Master Response 1 regarding statements for or against the project. Sidewalk and walkway improvements are included in the Project. No further response is necessary.

From: Tom Mendenhall [redacted]
Sent: Sunday, September 19, 2021 9:54 AM
To: nkhatri@cityofarcata.org
Subject: Fwd: Old Arcata Road Design Project
Attachments: AndersonLnCrosswalk.jpg

At the request of a group of neighbors on Anderson Ln and Brigid Ln and I resending this request to improve safety at the north end of Old Arcata Road. I consider this to be the least safe section of road and it will only get worse when the pavement is smoother and people drive faster around the corner.

Thanks,
Tom
[redacted]

---------- Forwarded message ---------
From: **Tom Mendenhall** [redacted]
Date: Sun, Feb 21, 2021 at 2:06 PM
Subject: Old Arcata Road Design Project
To: <nkhatri@cityofarcata.org>

Hi,
I know I'm late to the planning but have only lived in this neighborhood for a few years and missed the 2016 meetings. 48-1

I'm sure you realize the average speed on Old Arcata Road is above 25 mph. There is a curve in the road that makes crossing the intersection dangerous. Most people can not walk across a crosswalk in less than 4 seconds. Also pulling out in a vehicle in unknown traffic is really bad. It's just going to get worse when students return to Jacoby Creek school.

Attached is what I propose to create a safer crossing at Anderson Lane. I think speed hump #2 would be the most effective to slow down traffic.

Crosswalk Location
https://www.google.com/maps/@40.8527532,-124.0699706,230m/data=!3m1!1e3

The speed to distance calculator I used.
https://www.omnicalculator.com/physics/stopping-distance#how-to-calculate-the-stopping-distance

Animated video I made of the slides
https://youtu.be/_rZW9_qCI4g

Thanks,
Tom

Letter 48 – Response to Comments

Response to Comment 48-1

Request for improvements at Anderson Lane Intersection

Please see Response to Comment 1-1, Response to Comment 36-1, Response to Comment 43-1, and Response to Comment 43-2, which also pertain to design recommendations at the Anderson Lane intersection.

Comment Letter 49

From:	Ali Lee
To:	COM DEV
Subject:	[QUAR] Old Arcata Road Project -- Letter in Support of Safety Improvements
Date:	Monday, September 27, 2021 4:40:55 PM
Attachments:	OARSafety ArcataTSC let092721.docx
Importance:	Low

Attached please find a letter for the Arcata Transportation Safety Commission.

Thank you.

Ali Ong Lee
Bayside, CA

Arcata Transportation Safety Committee
City of Arcata
736 F Street
Arcata, CA 95521

Ali Ong Lee
[redacted]
Bayside, CA 95524
[redacted]

September 27, 2021

Re: Old Arcata Road Pedestrian and Bike Safety Project

Dear Arcata Transportation Safety Committee,

Thank you continuing the process of calming traffic on Old Arcata Road for pedestrian, cyclist (skate boarder, scooter, roller-skater) safety and for the safety of those who use wheelchairs. As a Bayside resident who commutes to Arcata by walking, by bicycling, and by electric vehicle, I urge you to support going forward with the proposed changes in the Old Arcata Road Project.

City staff (Engineer Netra Khatri, former Public Works Director Doby Class, Director of Environmental Services Emily Sinkhorn, formerly a Senior Planner with the Redwood Community Action Agency), the Arcata Transportation Safety Committee, and community members are to be commended for having long worked—for over a decade--on the Old Arcata Road Project slated for further implementation. It has been a process in which the city and community has invested a great deal of time and resources.

UNSAFE FOR BICYCLISTS, ESPECIALLY CHILDREN & NEW CYCLISTS

As a Bayside resident and bicyclist, I live exactly between the two cities, but relate more to Arcata for work and home. My two children, also bicyclists, live in Arcata; they did not embrace cycling until they moved to Arcata as adults for work and school. When they were children, they felt unsafe commuting from South Bayside to Jacoby Creek School and Arcata High School and back home alone. One of their friends got hit by a car when he was cycling from Rocky Creek Road onto Old Arcata Road, where there is an unsafe, blind turn.

I have been involved in increasing safety on Old Arcata Road through Bayside Pride, the Old Arcata Road Safety Initiative, and Jacoby Creek School. Thank you for helping to work with both the City of Arcata and County of Humboldt to install radar feedback signs, build pedestrian bump-outs, improve accessibility, and install speed humps—with corresponding signage—on Old Arcata Road.

More traffic calming measures are still needed not only in the proposed area, but also south of the Old Arcata Road and Jacoby Creek Road intersection to Myrtle Avenue and the Indianola Cutoff roundabout.

49-1

ROUNDABOUT CONTROVERSY

The precedent has been set regarding building roundabouts into Arcata and Bayside roadways, therefore, a new roundabout for traffic calming at the intersection of Old Arcata Road and Jacoby Creek Road would be consistent with existing infrastructure at:

- Samoa Boulevard & Union Street roundabout

49-2

- Old Arcata Road & Buttermilk Lane roundabout
- Buttermilk Lane & Margaret Lane roundabout
- Old Arcata Road & Indianola Cut-off Roundabout

What is more, in “America’s Car Crash Epidemic: Driving Kills as Many Americans Each Year as Guns Do. Experts Say that’s Preventable.” Marina Bolotnikova reports: “Installing roundabouts instead of traditional intersections is highly effective at saving lives in U.S. Rural areas, which have death rates far above the national average because of their high speeds and lack of physical barriers between lanes” (https://www.vox.com/22675358/us-car-deaths-year-traffic-covid-pandemic, September 19, 2021).

49-2 Cont.

UNSAFE WHEN HIGHWAY 101 TRAFFIC IS DIVERTED ONTO OLD ARCATA ROAD

More traffic calming measures are needed, like a roundabout at the intersection of Jacoby Creek Road and Old Arcata Road, to physically slow traffic to 20-25 mph since there is a school there and Highway 101 traffic north and south keep getting diverted onto Old Arcata Road when there is an automobile accident closing the highway in either direction as in the two examples below:

- “Wrong-Way Driver Killed on 101—January 4 ,2012” documented by the *Arcata Eye*: https://www.arcataeye.com/2012/01/wrong-way-driver-killed-on-101-january-4-2012/
- “Safety Corridor Crash Closed 101 Early This Morning”—January 13, 2020 documented by the *North Coast Journal*: https://www.northcoastjournal.com/NewsBlog/archives/2020/07/13/safety-corridor-crash-closed-101-last-night.

49-3

DOCUMENTED INSTANCES OF UNSAFE DRIVING ON OLD ARCATA ROAD

- https://kymkemp.com/2021/05/08/vehicle-into-power-pole-on-old-arcata-road/
- https://madriverunion.com/tag/old-arcata-road/
- https://lostcoastoutpost.com/chpwatch/2021/jun/19/210619HM00100/
- https://californiainjuryaccidentlawyer.com/sunny-brae-car-accident-at-anderson-lane-and-old-arcata-road-october-27/
- https://madriverunion.com/driver-takes-out-power-pole-on-old-arcata-road/ https://madriverunion.com/baysiders-would-shame-old-arcata-road-speeders-december-5-2012/

Thank you for advocating to move forward with the implementation of more traffic calming measures on Old Arcata Road, as planned and for which the Environmental Impact Report has been conducted.

Sincerely,

Ali Ong Lee
Cyclist & Old Arcata Road Safety Advocate
Bayside, CA

Letter 49 – Response to Comments

Response to Comment 49-1

Letter of support

This comment offers support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Response to Comment 49-2

Existing roundabouts in the area

The commenter notes there a number of existing roundabouts within the City and County, and the Project's roundabout would be consistent with existing roundabouts. The City agrees. No further response is required.

Response to Comment 49-3

Need for traffic calming measures

The comment states additional traffic calming measures are needed and includes links to local media coverage of traffic safety incidents within the Project Area. The purpose of the Project is to improve safety for all users throughout the Project Area. No further response is required.

From: Kari Love
To: David Loya; COM DEV
Subject: Old Arcata Bayside comments
Date: Monday, September 27, 2021 4:42:51 PM

Hi David,

I live in City of Arcata off Off Old Arcata Rd. --just up the road from Jacoby Creek School (1370 Clipper Lane, Bayside 95524). We are in support of the project which allows for a traffic circle at Jacoby Creek Road and the promotion of greater safety in this area. I believe my husband Mike sent in comments already but want to make sure!
Pedestrian safety (especially for elementary age children), bikers of all ages, and automobile traffic will all be much safer interacting in this tight space with this alternative. The current situation is sure to result in more accidents as traffic increases. The lack of sidewalks are unsafe to begin with and I know parents-- even within very short distances to school-- are afraid of their children walking or biking due to the unsafe traffic on the immediate road to or from school. 50-1
We were so excited to move from Eureka to a place where our daughter could walk right to school. Of course, we still noticed the bottlenecks each morning and afternoon/evening with daily schedules.
[redacted]s continue, and even though our daughter is now navigating on her bike to High [redacted]en I saw some flashing lights on the road just north of the [redacted]le guy that got hurt on his way home school?

Please let me know if you have any further questions or if we may assist the project in moving forward.
Thanks for your work on this and so many other Arcata projects,
~~Kari Lynn Love
[redacted]

Letter 50 – Response to Comments

Response to Comment 50-1

Letter of support

The comment offers support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Comment Letter 51

From: Stephanie Mietz
To: David Loya
Subject: Old Arcata Road Design Project
Date: Monday, September 27, 2021 5:00:20 PM

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Mr. Loya,

I am writing to you to comment on the Arcata Road Design Project. I have a child who attends Jacoby Creek School and crosses Old Arcata Road at Anderson on his way to and from school every day. I cross that intersection frequently when I walk him to school or walk my dog. Many drivers do not obey the speed limit and cannot or do not see the crosswalk until they are almost upon it when they are driving north on Old Arcata Road. I have seen several near misses with pedestrians, almost been T-boned making a left out from Anderson Road, and seen at least two traffic accidents at that location in the short four years I've lived there.

The intersection gets a great deal of use and traffic on Old Arcata Road will only increase with planned construction on 101 and the development that will accompany the transition of HSU to a Polytechnic University.

Many drivers do not obey the speed limit, nor do they recognize pedestrians in the crosswalk and there is no enforcement of the speed limit. Please consider traffic calming methods such as speed bumps and crosswalk lights that will alert drivers that a pedestrian is waiting to cross. 51-1

I both walk and drive Old Arcata Road between Anderson and Jacoby Creek Road several times a day. The stretch of road is heavily used by pedestrians and bicyclists and is very unsafe. I invite you to walk this area with me between 8:00 am and 8:30 when parents and students are trying to get to Jacoby Creek School, Mistwood, and Sunnybrae Middle School. It is a busy time of day; many people are rushing because they are late, and pedestrians and bicyclists are at risk.

I am asking you to prioritize pedestrian and bicyclist safety as this project develops. The communities of Arcata and Bayside value health and recreation and we need safe pathways to develop and maintain these habits.

Sincerely,
Stephanie Mietz
Brigid Lane, Arcata

PS Please cut the willows back that decrease visibility on the curve just before Anderson Road for northbound traffic. This is an ongoing maintenance item that needs to be done right now. 51-2

Letter 51 – Response to Comments

Response to Comment 51-1

Design recommendations specific to the intersection of Old Arcata Road and Anderson Lane

The comment provides design recommendations for the portion of the Project Area near Anderson Lane. Please refer to Response to Comment 36-1.

Response to Comment 51-2

Recommendations on vegetation maintenance near intersection of Old Arcata Road and Anderson Lane

The comment recommends vegetation maintenance near Anderson Lane. Thank you for noting the willows near Anderson Road. The City will review that area and perform vegetation maintenance within the public right away when possible.

Comment Letter 52

From: Carla Paliaga
To: David Loya; COM DEV
Subject: Re: Old Arcata Road Improvement project
Date: Monday, September 27, 2021 10:54:58 AM

Please accept this additional clarification that I fully support the roundabout option at the intersection of Jacoby Creek Road and Old Arcata Road. A crosswalk at that section without a roundabout would not slow traffic enough fo a safe crossing. I fully support slowing traffic at OAR and Jacoby Creek Road with a roundabout. Thank you! 52-1

On Friday, September 24, 2021, 03:35:23 PM PDT, Carla Paliaga [redacted] wrote:

I am writing to express my support for the Old Arcata Road Improvement project. As residents of Old Arcata Road with children whose grandparents live on Jacoby Creek Road, we frequently walk and bike the stretch of road that is slated for improvement. I cannot tell you how many reckless driving behaviors that I see on a regular basis along this stretch of Old Arcata Road. From our house there is no safe way to walk along Old Arcata Road and cross to Jacoby Creek Road. For our child who attends Jacoby Creek School, crossing OAR is a dangerous endeavor. The traffic circle and improved bike lanes will be welcome and appreciated. I have read the extensive EIR and I agree with the findings. The impacts can be mitigated as noted in the EIR. I live on Old Arcata Road a little bit north of Jacoby Creek School and I will be impacted by the construction of these improvements and I am in full support of this project. The inconvenience of construction will be worth a safer Old Arcata Road. I also fully support the sidewalk on Hyland. We have friends who live on Hyland and there is no safe way to walk up the road right now. It is highly utilized during Jacoby Creek drop off and pick up. I am in full support of the walkway on the west side of OAR. I only wish there was also a walkway along the East side as well. I hope this project begins as soon as possible. Thank you for attending to the safety of pedestrians and bikers along OAR.

previously submitted under comment letter 39

Thank you,
Carla Paliaga

Letter 52 – Response to Comments

Response to Comment 52-1

Letter of support

The comment offers support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Comment Letter 53

From: Anson Smith
To: David Loya
Cc: COM DEV
Subject: Old Arcata Road Roundabout comment
Date: Monday, September 27, 2021 6:07:01 AM

Dear David Loya,

I am writing in SUPPORT of the roundabout at the intersection of Old Arcata Road with Jacoby Creek Road.

I have been a bicycle commuter going to and from Bayside into Arcata for many years, and the intersection feels dicey for adult cyclists... I think that intersection needs to be made bikeable for my kids, and for other children.

53-1

Best,
Anson Smith
[redacted]
Bayside CA
[redacted]

Letter 53 – Response to Comments

Response to Comment 53-1

Letter of support

The comment offers support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

From: Cheryl Svehla
To: COM DEV
Subject: Old Arcata Rd. Safety Improvements
Date: Monday, September 27, 2021 4:18:32 PM

Hello,

We are students at Jacoby Creek School and we are in support of the safety improvements of Old Arcata Rd. We want people to slow down so we can walk to school safely without our Mom worrying.When we are walking we see many close calls. If we had a sidewalk we would feel safer walking to school and walking our dog in the evening.

We rarely witness people driving the speed limit and are pleasantly surprised on the rare occasion that it happens. 54-1

We think the community would be a lot safer if we had a sidewalk and roundabout to slow cars down.

Thank you,
Claire and Greyson Svehla (age 12 and 7)
[redacted]

Letter 54 – Response to Comments

Response to Comment 54-1

Letter of support

The comment offers support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Comment Letter 55

From: Cheryl Svehla
To: COM DEV
Subject: In Support of Old Arcata Rd. Safety Project
Date: Monday, September 27, 2021 4:06:10 PM

Good afternoon,

I am writing in support of the proposed safety improvements to Old Arcata Rd. As a resident of Bayside living within the project boundaries and a parent with two kids attending Jacoby Creek School I believe it is imperative that safety improvements are made.

We walk to and from school daily and daily we experience inconsiderate drivers speeding and crowding the bike lane we walk in. Drivers do not heed the posted speed limit signs and do not take extra precaution when school children are present. I have even witnessed numerous times people driving right through the crosswalk in front of the school while the crossing guard is standing in the middle, holding a stop sign, trying to get kids safely across the street. 55-1

Another challenge we experience on a daily basis is trying to get our of our driveway without getting hit.

I know that there are some residents who are concerned about losing the rural feel of our community but I implore you to please put safety first. I believe that if we make our community safer for pedestrians and cyclists more people will opt for these modes of transportation providing for a greater sense of community as we pass our neighbors on morning or evening walks. 55-2

Thank you for your time and consideration.

SIncerely,
Cheryl Svehla
[redacted]

Letter 55 – Response to Comments

Response to Comment 55-1

Letter of support

The comment offers support for the Project. Please see Master Response 1 regarding statements for or against the project. No further response is necessary.

Response to Comment 55-2

Prioritize safety

The comment encourages the City to prioritize safety. Please see Section 2.3 (Goals and Objectives) on page 2-2, which includes Project objectives related to safety improvements. No further response is necessary.

From: April Klingonsmith
To: COM DEV
Subject: OAR Public Comment
Date: Monday, September 27, 2021 1:49:57 PM
Attachments: OAR .docx

To City of Arcata:

Thank you for your roadway improvement efforts on Old Arcata Road to make it safer and more accessible for students at Jacoby Creek School, Sunny Brae Middle School, and the Bayside community. Your comprehensive plan reflects community feedback from your outreach efforts.

I really like your Old Arcata Rd rehabilitation/bikeway improvements you have proposed. I especially like the enhanced crosswalks, bikes lanes, extra turn lane at JCS, and the sidewalks from JCS to the Bayside Post Office. This will ease traffic during JCS drop off and pick times at the school and encourage families to walk or roll to school.

There are two things I think could be improved in the plan that would improve safety for JCS students, families, and school community.

56-1

- Anderson Lane crosswalk - I believe that safety improvements could be made to the crosswalk at the intersection of Anderson Lane and Old Arcata Road. Many JCS and SBMS students use this crosswalk before and after school, in sunny, rainy, foggy, stormy weather. Can it be made into an "enhanced crosswalk" like Bayside Rd and Hyland St. to increase visibility and enhance driver awareness?

- At JCS, Hyland Street sidewalk after crosswalk ends – I believe that safety improvements could be made at the end of the crosswalk at Hyland St. that leads onto Hyland St. JCS students/families use this crosswalk heavily to arrive/depart school during drop off and pick up times with a crossing guard. Currently, the crosswalk ends directly into Hyland Street, not into a sidewalk. The crossing guard exits students and families into the street with parked and moving cars. The sidewalk would make it safer for students and families as they enter/depart the school crosswalk. Can we get a sidewalk right after kids get off the JCS crosswalk onto Hyland St.?

Thank you for your dedication to this project.

April Klingonsmith
Bayside Rd. resident off Old Arcata Road

Letter 56 – Response to Comments

Response to Comment 56-1

Anderson Lane and Hyland Street crosswalks

The commenter would like the crosswalk at Anderson Lane to made into an enhanced crosswalk similar to those proposed at Hyland Street. The request will be considered as the Project's design advances.

The commenter would like to see an improved transition between the existing crosswalk and existing sidewalk at the Hyland Street intersection. The upgrade crosswalks will all terminate on a sidewalk or walkway and not in the active roadway. Please also see Master Response 1 regarding statements for or against the Project.

Comment Letter 57

From: De Zig [redacted]
Sent: Monday, September 06, 2021 9:34 AM
To: Netra Khatri
Subject: Jacoby Creek/ Old Arcata rd "round about"

Hi Natra-

I hear that the city is putting a roundabout at the crossing of Jacoby Creek Rd and Old Arcata.

This is disheartening. You'll be adding yet another distraction for drivers, as well as an obstacle for cyclists and pedestrians.

The main problem for that T section is Jacoby Creek Road is too wide there. Drivers are stupid. If you notice no other "T" sections on that road have problems. Why? Normal width of road. People drive right thru the stop sign on JCR. People cut off cyclists and cars at the OAR exit from the post office.

Don't believe me? Here is a clip from a friend:

https://nextdoor.com/news_feed/?post=196506932&comment=650076634&ct=ivM3JeVPIwS0RdB62tkAg2WP7-miB7KZx1t2nMEhTSgcphw2z5CApTL5xbvfknSV&ec=CUuITXfgC4y3JTZ2xRbYqsCEDVfj1pLaDEEEO8rW-uw%3D&lc=228 57-1

This behavior is normal there.

Best solution for that T section is to reduce the width of JCR at that intersection. Properly mark JCR. Have the post office OAR exit be made into an exit only. If you put a roundabout there, these cut throughs that you see in the video will occur more frequently, as drivers will be too lazy to go all the way around.

Adding more distractions and obstacles will only make it more hazardous, which will result in a lawsuit against the city- I can guarantee that.

Thank you for your time

Denise Ziegler
[redacted]

Letter 57 – Response to Comments

Response to Comment 57-1

Opposition to Project and design recommendations at Jacoby Creek Road intersection

The comment offers opposition to the Project and includes design recommendations for the Jacoby Creek Road intersection. Please see Master Response 1 regarding statements for or against the Project. In development of Alternative 2 (Modified T-Intersection), the City has worked to narrow the width of travel lanes to the greatest degree feasible and allowable. This comment does not raise any new environmental impacts and no amendments, additional clarifications, or additional mitigations are warranted to address environmental impacts.

From: Constance Brown [redacted]
Sent: Saturday, September 18, 2021 4:49 PM
To: nkhatri@cityofarcata.org
Subject: Safety improvements old Arcata road

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

I'm writing to encourage and cajole you to put some attentions to the intersection of Anderson Ln and Old Arcata Road. The crosswalk must be made bolder to protect the very young children that walk from our neighborhood to elementary school daily. In addition older walkers like myself deserve a well marked path to cross the busy traffic right where the road curves and makes visibility a challenge. Maybe a blinking light to engage when crossing, speed humps or 'school crossing' signage. Please put your attention to this small part of your project...we deserve safe passage!! 58-1

C.M. Brown
[redacted]

Sent from my iPhone

Letter 58 – Response to Comments

Response to Comment 58-1

Anderson Lane intersection

The commenter would to see safety additional safety improvements at the Anderson Lane intersection. The request will be considered as the Project's design advances.

3. Comments Received Following Circulation

3.1 Comments Received During the Planning Commission Meeting

On October 12, 2021, the Arcata Planning Commission held a noticed public hearing to hear public comment on the proposed project. The recording of the meeting is available online at: http://arcataca.iqm2.com/Citizens/SplitView.aspx?Mode=Video&MeetingID=3291&Format=Agenda.

During the meeting, no new concerns were raised in addition to those received during public circulation of the DEIR (see Section 2). The hearing was held after the end of the circulation period of the Draft EIR. In general, there were attendees both for and against with more voices in favor of the roundabout and general design. Concerns were raised by commenters regarding roundabout proximity to Mistwood School/Temperance Hall and the proposed roundabout's impact to veiwsheds and adjacent parking in the public right of way. However, there was general consensus that roundabouts do slow traffic, more successfully that other methods. After hearing public comment and a brief discussion, the Planning Commission voted in favor of the project as designed and recommended project approval by the City Council.

3.1.1 Summary of Planning Commission Deliberations

– White-in favor of roundabout
– Mayer-shouldn't weigh in if not giving a formal recommendation-concerns on redaction
– Barstow-no point in commenting
– Tagney-in favor of project, surprised at pushback; roundabouts are only way to slow traffic down; disappointed PC doesn't get a chance to make formal recommendation
– Vassaide-Elcock-in favor of project, would like to send message to the Council

Commissioner Tangney made the motion to support project as presented, including roundabout-Commissioner White seconded. Vote: 4-1 (Commissioner Mayer abstained).

3.1.2 Summary of Public Comment

Marc Delany

– Intersection goes through a known Wiyot Village
– 30% design – not finished
– T-intersection
– Area outside City of Arcata
– LAFCo needs to be applied
– CalTrans is the Lead Agency
– Project needs to be consistent w/ (?)
– Project relies on 2016 SHN report w/ conflicting conclusions
– Project is defacto annex at

Chip Sharpe

– Much of what is being proposed addresses his concerns
– Project should emphasize rift in community

– In favor of roundabout
– Offered compromise on parking

Tim Zoellick

– Lives close to roundabout
– Spoken w/ 20 households-tremendous support
– Safety is a serious issue at Bayside Corners
– Roundabout will slow traffic
– Alt. 2-T-intersection problem w/ their option will not slow traffic

Jim Moore

– Thank the City and engaged neighbors
– Only minimal impacts on Mistwood
– Add rumble strips ahead of intersection
– People who don't want to slow down, won't

Alice Finen-Coordinator of Temperance Hall

– Chip & Jim don't represent Mistwood
– All the kids think the roundabout is too close
– Plans need to reflect the plans of the youth
– Should be design for safe space
– Traffic may come in to the school

Carla Paliaga

– Live on JCR & walk this area a lot-full support
– Motorcycle passed at
– Second option doesn't address safety
– No historic impacts

Gordon Inkeles

– For 30 years the project has started and stopped multiple times
– Uses the road frequently
– 100's of kids walking in traffic
– Let's fix it

Grayson Finen

– Goes to Mistwood-feels it is too close to school-what if a logging truck lost control

Kathleen Stanton

– Looked in pump house-City should look into whether they could move it.
– 35' is too close to Mistwood
– Impact on national register
– 45' was in the EIR, why 35' now?

– Bayside is working w/ county to reduce speed coming into Arcata
– Historic impacts not addressed

Patrick Cudahy

– Support roundabout
– Slow people down
– Improve safety
– Improve historic resources by adding a “gateway”
– Rumble strips and humps don’t slow people down

Jude Power

– Process started in 2000 and interrupted several times
– If left as T-intersection eventually a left turn won’t be possible
– Increasing traffic-passed by
– Population is expanding
– More people support the roundabout then appraise it

Johnathan Finen

– What do the sidewalks connect to? Seems silly
– Adding more concrete and asphalt isn’t eco-groovy
– Flashing lights impact on neighbors
– Will delay response of EMS
– Each traffic calming add 15 seconds to response time
– CPR
– Fires double every 9 minutes
– Roundabout

Kristi Colbert

– Lived for decades
– Have seen traffic increase
– Rides bike
– Full support
– NIHS roundabout reduce accidents and severity
– There are going to be sacrifices

Jeremy Svelha

– Live on project area
– Work for GHD
– Neighbors have had multiple accidents
– Roundabout is the only permanent fix
– Walk daily and see concerns of safety

Lee Dedini

– In favor of roundabout

Susan McPherson

– People would slow down at roundabouts but then speed up again in the straightaways

4. Errata

The purpose of this errata is to document revisions to the DEIR that are intended to clarify project details since it was submitted to the Office of Planning and Research State Clearinghouse on August 9, 2021, and publicly circulated between August 9, 2021 and September 27, 2021. The following Project details are addressed in this errata, as shown in Table 4-1, below.

The errata includes excerpts of text from the DEIR that are proposed for modification, and does not include the entire DEIR. Specifically, the entire subsection that contains the text proposed for modification is copied into the errata, and newly proposed text in the errata is **underlined and bolded**, deleted text from the original DEIR is stricken with ~~single strikethrough,~~ and unchanged text remains in normal font. Only the subsections of the original DEIR that are proposed for modification are copied into the errata.

Table 4.1 List of Proposed DEIR Text Modifications Captured in Errata

Section of Errata	Topic of Proposed Changes	Section of DEIR
Section 4.1	Project Description Text Clarifications	Section 2 - Project Description
Section 4.2	Cultural Resources Text Clarifications	Section 3.4 – Cultural Resources
Section 4.3	Inclusion of result of additional investigations	Section 3.4 – Cultural Resources
Section 4.4	Drainage	Section 3.9 – Hydrology and Water Quality
Section 4.5	Vehicle Miles Traveled	Section 3.11 – Transportation

4.1 Project Description Text Clarifications

The following details have been added to Section 2 (Project Description) of the EIR as errata.

Section 2.5.1 – Repaving Along Old Arcata Road and Adjacent Bike Lanes

The existing asphalt roadway would be rehabilitated by overlaying the existing surface and/or grinding-out and replacing the existing surface. Excavation would not extend into the native subgrade, except in isolated areas where deeper excavations may be required to remediate poor soil/subgrade conditions. **The pavement overly will be three to six inches thick.**

Section 2.5.4 Crosswalks and Speed Humps

Existing cross walks and speed humps would be upgraded coincident with repaving. New speed humps would be located north of the Hyland Street intersection and south of Jacoby Creek School to improve safety and provide vehicular speed control. A raised crosswalk in front of Jacoby Creek School at the Hyland Street intersection would remain. Crosswalks would also be integrated into the new Jacoby Creek Road Roundabout, discussed below. All crosswalks across Old Arcata Road and Jacoby Creek Road are proposed to include user activated warning lights (e.g., LED enhanced signs or rectangular rapid-flashing beacons[RRFB]). **The crosswalks would also include detectable warning surfaces, which will be cast in wet concrete during construction and secured with anchors.**

4.2 Cultural Resources Text Clarifications

The following details have been added to Section 3.4 (Cultural Resources) of the EIR as errata.

Section 3.4 Typographical Error

There is one typographical error in paragraph 3, Page 3.4-11: “Parcels outside the County right of way…” should read, “Parcels outside the County**/City** right of way…”

Section 3.4.5 Methodology, page 3.4-11

Of the six parcels outside the County right of way that are in the APE **(US Post Office (current) at 1836 Old Arcata Road, Residence at 1835 Old Arcata Road, Residence at 1895 Old Arcata Road, Old Jacoby Creek School at 2212 Jacoby Creek Road, Former Bayside Grange at 2297 Jacoby Creek Road, and former Temperance Hall at 1928 Old Arcata Road)**, JRP identified three historic-era (45 years old or older) built environment resources and noted their location on the APE map using Map Reference (MR) numbers. The three properties are: 2212 Jacoby Creek Road (MR 1), 1928 Old Arcata Road (MR 2), and 2297 Jacoby Creek Road (MR 3). The building at 2212 Jacoby Creek Road (MR 1) is the Old Jacoby Creek School, which was listed in the NRHP in 1985 (Van Kirk 1984). As a NRHP-listed property, it did not require re-evaluation in the HRER, and it is automatically listed in the CRHR. The two other built environment resources in the APE required recordation and evaluation for NRHP and CRHR eligibility on California Department of Parks and Recreation (DPR) 523 forms. The property at 1928 Old Arcata Road (MR 2) had not been previously evaluated for the NRHP or CRHR. The building at 2297 Jacoby Creek Road (MR 3) is the current Bayside Community Hall and the former Bayside Grange. It was listed in the CRHR in 2002, but documentation associated with that listing has not been found (OHP 2012). The property was not evaluated for NRHP eligibility until JRP’s HRER in 2020. JRP’s evaluation of these two properties concluded that both meet the criteria for listing in the NRHP and CRHR. These properties were evaluated as per CEQA Guidelines Section 15064.5(a)(2)-(3) using the criteria outlined in Section 5024.1 of the California Public Resources Code. Thus, all three of these properties in the APE are historical resources for the purposes of CEQA (JRP 2020).

4.3 Cultural Resources – Results of Additional Investigations

During public circulation of the DEIR, the City completed additional subsurface archaeology associated with their obligations under the National Historic Protection Act (NHPA) Section 106 process, expanding the prior subsurface archaeology completed for the Project. The investigation was conducted between August 5 and August 12, 2021 by Pacific Legacy archaeologist Christopher Peske, B.A., under the supervision of Principal Investigator John Holson, M.A./RPA, directed a team of five archaeologists: William Rich, M.A., Jennifer Mak, M.A., Kelly Hollreiser, B.A., Heather Militello, B.A., and Jack Flynn, B.A. Darlene Buckley of the Wiyot Tribe served as the tribal monitor for the duration of the fieldwork. Janet Eidsness, THPO for the Blue Lake Rancheria, Mark Arsenault, Associate Environmental Planner at Caltrans, and Darrell Cardiff, Senior Environmental Planner at Caltrans reviewed and approved the archaeology study plan in advance of the field investigation. The investigation focused on key locations of interest as directed by Caltrans cultural staff specifically pursuant to the Section 106 process and were generally located near Hyland Street and along Old Arcata Road near Jacoby Creek School, within the study area for cultural resources.

Results of the investigation were negative for indigenous and historic-period deposits (Pacific Legacy 2021). As such, the environmental analysis provided under Impact CR-2 (page 3.4-20) remains accurate and has been further bolstered by the results of the August 2021 archaeological investigation. Given the portion of the study area with planned ground disturbance near sensitive areas was determined to be

negative for subsurface indigenous and historic-era deposits, impacts to such resources would not occur as a result of Project implementation. However, to ensure any potential inadvertent discoveries of subsurface cultural material would not result in a significant impact, Mitigation Measure CR-1 remains incorporated into the Project, as described in the DEIR (pages 3.4-20 and 3.4-21).

No additional text modifications to the Final EIR are proposed.

4.4 Drainage

The following text has been incorporated into Section 3.9 (Hydrology and Water Quality), Impact HWQ-c (i):

The Project would be designed consistent with recommendations of the drainage study to ensure consistency with City and County standards (see Mitigation Measure HWQ-1). The existing drainage pattern of the Project Area is limited to ad hoc unpaved roadside ditches and underground storm drain infrastructure. Roadway and utilities improvements would not result in a realignment of the existing drainage pattern of the Project Area, and the Project Area would not modify a stream or watercourse. Some storm drains and ditches with the Project Area ultimately drain to adjacent agricultural fields on private properties and would continue to do so after construction is complete. **Based on the 30% design, the Project would increase impervious surface by approximately 15,200 square feet (approximately 0.35 acres), which is less than 0.03% of the total 12.8 acre Project Area as shown in Figure 2-2 through Figure 2-5 of the DEIR and thus negligible. Of the approximately 15,200 square feet, approximately 8,000 square feet are attributable to the roundabout, approximately 7,150 are attributable to the proposed pathways. These numbers will likely adjust as the design process progresses; however, any such adjustments are likely to be substantial. These details have been added to the Errata in Section 4; however, impact analysis remains unaffected. To improve drainage conditions near the roundabout, increased subsurface storage (e.g. larger pipes or parallel pipes) would be used to balance the modest increases in impervious surface. If necessary, permeable pavement could be incorporated into the design in key locations (e.g., parking near the pumping station) to reduce surface runoff.** There would be no impact.

4.5 Vehicle Miles Traveled

The following text has been incorporated into Section 3.11 (Transportation), Impact TR-b:

Section 15064.3, subdivision (b), of the CEQA Guidelines lists the criteria for analyzing transportation impacts from proposed projects. The criteria are broken into four categories, including land use projects, transportation projects, qualitative analysis, and methodology. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. This section was recently added by the state legislature in an attempt to separate CEQA's purpose and role from traffic or other issues related to ease of use of single occupancy vehicles. For this reason, impacts to parking are not analyzed as an environmental impact in the section or in other areas of this document. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. Because the proposed Project would not increase the length of roadway, add new roadways, or increase the number of travel lanes, there would be no increase in vehicle miles traveled. By promoting multi-modal transportation, the Project would reduce vehicle miles traveled through the Project Area.

Projects that result in the potential to increase VMT include:

- **Changes in land use**
- **Expanded roadways (e.g., new roads, additional lanes)**
- **Private development**
- **Expanded public service facilities, such as new police stations, new fire stations, or new administrative buildings**
- **New and expanded parking lots**
- **Residential development, such as a new sub-division**

The proposed Project includes none of the above listed elements and does not include any component that could be characterized as resulting in a potential increase to VMT. To the contrary, the Project will narrow roadways and promote multi-modal transportation. By its very nature, the Project is VMT-reducing. As stated in Section 3.11 (Transportation), Impact TR-b (page 3.11-11), per the California Office of Planning and Research's guidelines for evaluating transportation impacts in CEQA, *for roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements* (OPR 2019). By promoting multi-modal transportation, the Project will reduce VMT throughout the Project Area and would thus not result in an environmental impact under CEQA. Instead, the Project would result in an environmental benefit by reducing the existing VMT through the Project corridor.

PRC 21099 (b) (1), upon which the CEQA VMT guidance is based, specifically states the purpose of the VMT criteria is to promote, "the development of multimodal transportation networks," consistent with the fundamental goals and objectives of the Project as stated in Section 2.3 (Goals and Objectives) on page 2-2. Similarly, the OPR guidance notes the overall purpose of updating CEQA to include VMT analysis is to help achieve California's long-term criteria pollution and greenhouse gas emission goals, based on four strategies that include, "plan and build communities to reduce vehicular greenhouse gas emissions and provide more transportation options (OPR 2019)," which is also directly supported by the Project's goals and objectives related to multi-modal transportation.

Other applicable considerations in the OPR guidance note the criteria for determining the significance to transportation impacts must promote the development of multimodal transportation networks. The core goal and objectives of the Project promote the development of multimodal transportation networks by upgrading and extending the walkway and sidewalks, along with upgraded intersection safety, throughout the Project Area.

Thus, the Project is consistent and entirely on par with the expectations of the OPR guidance for evaluating transportation impacts in CEQA. Lastly, the OPR guidance clarifies that when evaluating impacts to multimodal transportation networks, lead agencies generally should not treat the addition of new transit users as an adverse impact. Therefore, any success the Project ultimately achieves to increasing multi-modal transit (e.g., additional pedestrians and bicyclists using Old Arcata Road and adjacent bicycle lanes, walkways, and sidewalks) should not be considered an environmental impact under CEQA. The impact would be less than significant.

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Appendices

Appendix A - 30% Design Planset
Appendix B - Historical Resources Evaluation Map